NATIONAL CAR BUILDER

VOLUME XV.
NUMBER 9.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

$1.00 PER ANNUM
SINGLE NUMBERS TEN CENTS.

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SEPTEMBER, 1884.
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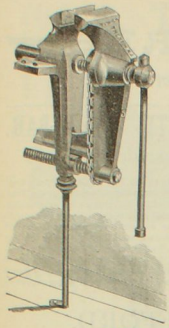

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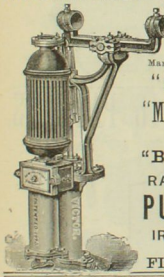

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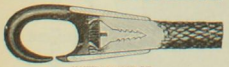

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All the main features, such as leveling car, turn table, self adjustable step for vertical post, twenty feet hoist, working over embankments, swinging load—car body or more—direct on to freight car, hinged jacks, direct grapples to rail, and other important features, all perfected and patented by Jewett, foreman of a wrecking gang for many years. For further information apply to the builder,

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Patent Twist Drills, Machine Bits for Wood, Bit Stock Drills, Reamers, Standard Gauges, Milling Cutter and Special Tools, for use in Railroad, Car and Locomotive Shops. **NEW BEDFORD, Mass.**

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SOLE MANUFACTURERS OF
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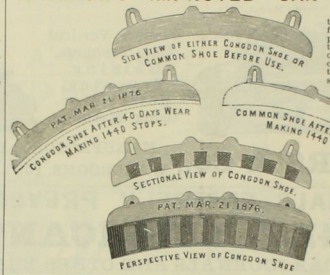

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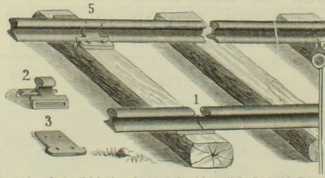

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Are doing all you claim for them, in use some ten months and clean no fires where they are. Putting them in all engines as fast as they come in the shop. We run our engines the long run, 228 miles, and when they get through the fire is as clean as when starting out. Ten months in use.

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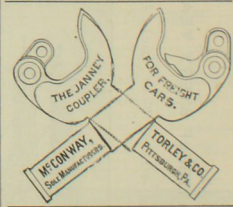

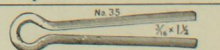

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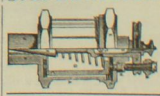

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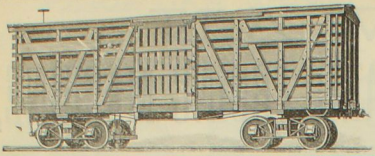
LOCKPORT, N. Y.



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MANUFACTURERS OF

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BRADLEY CAR WORKS, WORCESTER, MASS.

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MANUFACTURERS OF EVERY DESCRIPTION OF

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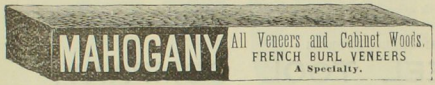
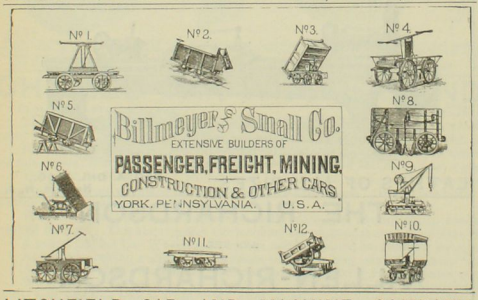


SAW MILLS AND OFFICE Foot 10th & 11th Streets, East River, NEW YORK.



LITCHFIELD CAR AND MACHINE COMPANY,

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Manufacturers of all kinds of Passenger and Freight Equipment, both Wide and Narrow Gauge.

CAR WHEELS A SPECIALTY IN THE MACHINERY DEPARTMENT.

Especial attention is given to furnishing Hoisting Engines, Pit Cars, Dumps, etc., etc., for Coal Mines, as well as building Stationary Engines and Boilers, and General Brass and Sheet-Iron Work.

KNOXVILLE CAR WHEEL CO.,

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CHILLED WHEELS FOR CARS,

ENGINE TRUCKS AND TENDERS,

USING STRICTLY

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Freight, Coal, Dump, and Mine Cars. Capacity six cars per day.

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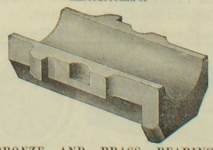

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IRON CLAD PAINT.

Trade-Mark Patented.

This Paint is used by nearly all the Railroads in the Country.

Used by L. S. & M. S., Wabash R'y, C., C., C. & I. R'y, C. & P. R'y, C. H. & D. R. R., Cincinnati Southern R'y, N. Y., L. E. & W. R'y, (Erie), Southern Central R. R., Canada Southern, Mobile & Ohio, N. O. & Mobile, Macon & Brunswick, Penn. R. R., C., M. & St. P. R'y, A. & N. R'y, R. & D. R'y, Carolina Central, P., C. & St. L. R'y, P. & E. R. R., M., L., S. & W. R'y, K. & D. M. R'y, W. C. & A. R. R., M. C. & N. R'y, N. C. & St. L., N. I. & E. R. R., L. & G. N. R., etc., etc.

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Capacity 350 Wheels per day. Wheels made by improved process. Far more durable than those made in the ordinary way.

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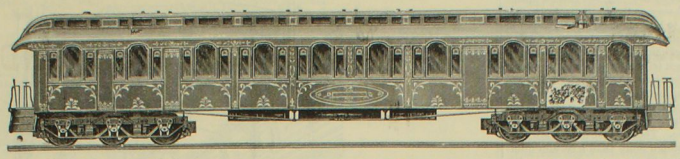
Index to Advertisements in the National Car-Builder.

THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XV. NUMBER 9. | SEPTEMBER, 1884. | SINGLE NUMBERS, TEN CENTS. $1.00 PER ANNUM.

Miscellaneous Items.

TEN engines on the Pennsylvania system are now being equipped with an electric locomotive head-light.

THE Gilbert Car Manufacturing Co., of Troy, are building five passenger coaches for the Florida, Savannah & Western road.

THE Suspension Car Truck Co. has purchased ground for shops in Chicago, and will expend at least $30,000 in the erection of buildings before July 1, 1885.

THE Missouri Car & Foundry Company has purchased the works of the Indiana Car Company, located at Cambridge City, Ind., and now has one of the most extensive plants in the country.

MURRAY, DOUGAL & CO., Milton, Pa., are building 200 8-wheel coal hopper cars of 20 tons capacity for the New York, Susquehanna & Western road. They are to be equipped with Congdon brake shoes.

THE Cook Locomotive & Machine Works, of Paterson, N. J., have contracted to build three locomotives for the Indianapolis, Bloomington & Western, and ten for the Minneapolis & Northwestern roads.

ONLY five per cent. of defective wheels removed on the Lehigh Valley road is on account of sharp flanges, while 40 per cent. of all removals on one of the great trunk lines is reported to be from this cause alone.

A GERMAN paper says that a roof can be made fire-proof by covering it with a mixture of lime, salt and wood ashes, adding a little lamp-black to give a dark color. This not only guards against fire, it is claimed, but also in a measure prevents decay.

MCKEE, FULLER & CO., of the Lehigh Car Wheel Axle Works, have received the contract for the building of 200 gondola 20-ton coal cars for the Lehigh Valley road, and will commence operations at once, thus giving employment to a larger number of men.

THE *American Machinist* pays a high tribute to the ability and worth of Mr. A. J. Pitkin, who has been promoted to the position of Superintendent of the Schenectady Locomotive works, and who is a very young man to occupy so responsible a position.

THE Phœnix Bridge Co., of Phœnixville, Pa., have secured the contract for the erection of a new iron bridge over the Delaware River, at Trenton, N. J., which will supply the place of the wooden structure recently destroyed by fire at that place. The contract price is $648,500.

THE Harlan & Hollingsworth Co., and the Jackson & Sharp Co., are building Mann boudoir cars, some of which are to be finished in a style surpassing in elegance any of these cars previously built in this country. They are to have Wednesbury 42-inch wheels and French elliptic and spiral springs.

IT is said that a cantilever bridge is to be built over the Ohio River between Louisville and New Albany. Its length will be 2,452 feet and its width 54 feet, with two wagon and two railway tracks and a passageway for foot passengers. It will be built on the same plan as the one at Niagara Falls.

THE Lima (O.) Car Works have closed down for an indefinite length of time, but the company is straightening up the books and getting matters upon a good financial basis. It is stated that C. S. Brice, of New York, has purchased nearly all the stock, and will run the works on a larger scale than ever.

THE Paige Car Wheel Co. is filling an order for 800 33-in. wheels for the Northern Pacific road and a number of smaller orders for both eastern and western roads. The company recently filled an order for 40 36-in. wheels for South American cars, and reports that these wheels are being rapidly introduced and are doing satisfactory service many of them having run over 200,000 miles without turning.

THE New York Central & Hudson River Railroad Co., having decided not to rebuild the wood-working shops of the New York & Harlem Division, at Morrisania, which were recently destroyed by fire, Mr. C. E. Garey, the master car-builder of that division, has resigned his position. Mr. Garey is a prominent member of the Master Car-Builders' Association and has been connected with the road for many years.

THE near approach of the time when the iron rail will have become extinct, is forcibly illustrated by the following table, presented by the *American Manufacturer*, showing the production of all sizes of these rails in the last four years:

1880	403,702 net tons.
1881	488,581 "
1882	227,874 "
1883	64,954 "

AT the Packerton shops of the Lehigh Valley road eight box cars or thirty-three coal cars are "put up" per day when all the building-tracks are used. A crew of six men can put up eight standard drop-bottom coal cars in six days. All repairs are done by contract. Each job is estimated, the time averaged and a standard rate fixed for it When a rate is established it remains fixed until some change is made in construction or method of doing the work.

H. K. PORTER & CO., of Pittsburgh, are building a ver small locomotive for hauling blooms at Bessemer Steel Works. The new processes of steel manufacture require ingots and blooms to be moved when at a white heat. This has proved disastrous to the mules which formerly did the work, and baked mule is, from this cause, not as plentiful as it was. The locomotive has 5-inch cylinders, weighs only three tons, and can be straddled by an ordinary-sized man.

A COMPOSITION for removing scale from steam boilers has recently been patented. The composition consists of a decoction of tanbark ooze and catechu, logwood, chestnut leaves, spruce-hemlock leaves, gall nuts and sumac bark, and carbonate of soda, oil of sassafras and alcohol. If that mixture does not make the inside of a boiler sick enough to eject scale or anything else not riveted to the sheets, there is no use trying doctoring any longer for the purpose.—*American Machinist.*

THE CINCINNATI CORRUGATING CO., of Cincinnati, O., manufacturers of corrugated sheet-iron, have purchased the entire interests, patents, franchises, machinery and good will of the New York Iron Roofing and Paint Works, in the iron roofing business. The purchasers are now the largest manufacturers of metallic roofing and siding in the United States, and with this extension of their facilities, and the high character of their products already acquired, they are enabled to offer inducements to their patrons that are worthy of special attention.

THE city of Zacatecas, in Mexico, has street car lines through the principal streets, and also one to Guadalupe, a distance of nine miles. These street cars all run together. The traveler will often wait an hour for a car, and then he can have his choice of a dozen. It seems as if the Mexicans did not have ingenuity enough to build a switch. From Zacatecas to Guadalupe it is all down hill. They have mules to draw the cars up the hill, and then the mules are loaded in one car and the passengers in the other, and they all ride down the hill together.—*Cor. Rochester Democrat.*

THE passenger and ferry-house of the Pennsylvania Railroad, at Jersey City, which was destroyed by fire August 4, is rapidly being replaced by a new one. The new structure will occupy the same space that the old one did, and be built of the same kind of materials. Some changes, however, will be made in the internal arrangement, which will be an improvement. The waiting-room for passengers will be considerably enlarged, and some changes made in the driveways for teams. The style of interior finish for the waiting-room, restaurant and ferry-house will be similar to what it was before.

THE *American Machinist* says that the safe operating of the elevated railways of New York City is no doubt largely due to the efficiency of the Eames vacuum brake, by whose magic power the engineer's hand controls every wheel of the train; that there has been no recorded failure of the brake in two years, and that it is doubtful if there has ever been an accident of the slightest kind on these roads that was due to the failure of the brake, the apparatus of which is subjected to the continual scrutiny of highly trained machinery inspectors, so that repairs can be made before any part of it deteriorates so far as to cause risk of failure.

MR. J. AUG. DURGIN has taken charge of the New York Locomotive Works at Rome, N. Y., as Vice-President and General Manager. Mr. Durgin has his headquarters for the present at No. 34 Pine street, New York, but will spend as much of his time at Rome as may be necessary to secure the proper management of the works. Mr. Durgin is well and widely known to locomotive men and railroad officers generally, having been for eight years Superintendent of the Pittsburgh Locomotive Works, and for seven years Agent and Superintendent of the Rhode Island Locomotive Works. He now returns to active business after a well-earned vacation of a year, which he has spent chiefly in traveling in Europe and Mexico.—*Railroad Gazette.*

IN May last, Mr. W. B. Snow, the Master Car-Builder of the Illinois Central road, had in his shop an old car, No. 56, which was built in 1864, and which was probably the first, or one of the first cars built with carlines which conformed to the sectional outline of the main and raised roof, instead of crossing directly from one side to the other of the lower roof. This car has iron carlines 2¼ inches wide by ¼ inch thick. They are not placed as now in the center of the wooden ones, but bolted to them, one on each side in pairs. The raised roof is 38 feet long and has five pairs or sets of carlines. The ends of the roof are rounded, and the total length of the car body is 45 feet. The car is still in apparently good condition. The inside finish is to be replaced by a more modern style.

THE portion of the Baldwin Locomotive Works, known as the old machine shop, was destroyed by fire on the evening of August 4. All the machinery in the shop was destroyed, also many valuable patterns, gauges, templets and drawings. A larger and much more convenient shop will at once be erected to take the place of the old one. It has long been contemplated to replace the old building with a more commodious structure, and plans had been partially prepared for such a building. These will now be completed, and as soon as the *débris* can be removed from the wreck, the work of rebuilding will commence. The progress of the work in the shops will not be seriously delayed. There were about 2,200 men employed in the works before the fire, and some 200 will be deprived of employment for a few weeks, until new tools are got running.

THE Jackson & Sharp Co. have recently completed a magnificent new car for the Worcester Excursion Car Company. It is named David Garrick, after the famous actor. The exterior of the body is painted a dark green, and is elaborately ornamented in gold leaf. The name and number (116) of the car is emblazoned in gilt on the sides, while that of the company is inscribed in gilt, shaded with green, on the letter board. The red mahogany of the window sashes forms a pleasing contrast to the other parts of the exterior. The body is carried by ordinary six-wheeled trucks, with Washburne's steel wheels, French's elliptic and spiral springs, and master car-builders' standard axles. Beneath the body are capacious refrigerators and lockers for the storage of meats, provisions, groceries, small baggage, etc., with flag pole, ladders, tent poles and other outside conveniences.

"THE Inter-State Industrial Exposition of Chicago" will open September 3 and close October 18. Some important improvements have been made in the exposition building. The elevator has been removed to the south end to make more room for the machinery department. The art gallery has been rebuilt and is now fire-proof and independent of the main building, and the entire exposition structure has been painted with fire-proof paint. The machinery exhibits will be more varied and extensive than in former years, and will include lace and cotton-weaving machinery, new wood-working processes and improved electric apparatus. Among other attractive features there will be the new process of boot-making, Japanese artists working on their specialties, elevated railway improvements, etc. The art exhibit will be rendered specially attractive by contributions from American artists abroad.

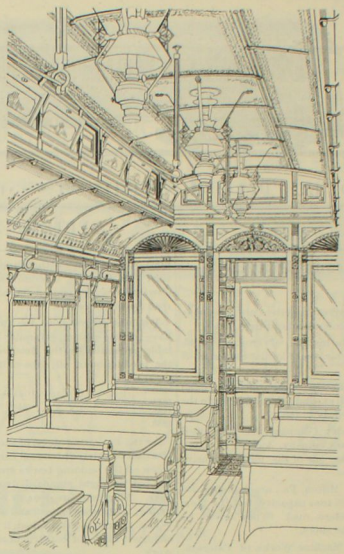
THE Boston *Advertiser*, commenting on the law recently passed by the New York Legislature, making the malicious destruction of trunks, etc., by the baggage fiend a misdemeanor, says: "This is all very well, but there is another side that people ought not to lose sight of. The growth of trunks has been greater, relatively, than almost any other growth in this rapidly developing country. They are often too heavy for two strong men to handle with ease or safety, and when, as often happens, they must be moved by only one man, and with the utmost celerity during the short stop of the train, the 'baggage fiend' is more sinned against than sinning, and he is entitled to the sympathy and protection of the public. There ought to be a law that no piece of baggage shall weigh more than a certain number of pounds—whatever weight an average man can lift with safety to his health and to the baggage. In that case those who require very bulky packages would make them of light and flexible material. Railroad companies can regulate this if they agree upon it, and more in the interest of humanity than of property they ought to try."

A TEST of a very ingenious automatic freight car brake invented by Mr. L. S. Colburn, of Oberlin, O., was made in Cleveland, on July 18. The invention consists of a U-shaped iron frame or yoke, which is hinged to the cross-beam of the car, carrying a friction wheel provided with suitable axle to which the brake chain is attached. This wheel is suspended over the car axle by means of a chain attached to the front end of the iron frame, and also connected above to the arm of a rock shaft, which extends to the side of the car, and there connects with an upright lever reaching about one foot above the top of the car. This lever is held in a perpendicular position by a spring catch, which is operated by a double-acting lever or trip reaching to the center of the car-deck. When it is desired to set the brakes on one or several cars, as in the ordinary handling of a train, the brakeman has only to move the trip either backward or forward with his foot (which can be done on the run). This allows the friction wheel to drop upon the revolving car axle, which immediately winds up the brake chain. But to more thoroughly provide against accidents, such as broken couplings, approaching trains, etc., the tripping device is arranged for the reception of a small cord or rope, whereby the whole train can be connected either with the cab or caboose, or both, and by a sudden pull upon this cord, every brake upon the train can be set instantaneously. In case of a broken coupling the brakes would all be set automatically.

MR. J. M. LOWRY, the General Master Mechanic of the Chicago, Milwaukee & St. Paul road, has some conveniences at the West Milwaukee shops for handling and cleaning work, which are not often equaled and which seem to be entirely new. When an engine comes to the shop for repairs, it goes at once to the drop-table, where it is stripped of wheels, rods, valve gear, etc., and placed on shop trucks. Alongside the drop-table, and in the same room, there is a large pickling tank, containing hot soda or potash water. This tank is of sufficient size to take the longest eccentric straps and rods, or any of those parts of the engine which have to be taken off and cleaned. All the work from one engine will go into the tank, which, when full, is heated by turning on the steam. In this tank they are allowed to stay until all grease, paint, varnish or dirt is removed and the metal is perfectly clean and bright. They are then sent into the shop to receive the necessary work. This plan saves considerable time which would otherwise be expended in cleaning, and has the advantage of being very cheap, while the parts themselves are in better condition for the machinist than they are by the usual methods. In many cases the advantage of having clean metal to work on makes the time required for repairs so much shorter that the whole cost of cleaning is saved in a single piece. In the round-house steam and hot water pipes are carried to the outer end of every stall, and those connections are so arranged that steam or hot water can be used for washing out boilers and doing much of the cleaning-up work needed about an engine.

Amateur Railroading.

Some years ago, there was a section of railroad track completed, but not operated, between Fredericksburg, Va., and a way station a few miles distant. In order to utilize the track for the time being, a man who owned a small stationary engine mounted it on a flat car, made a crank connection with the wheels, and with a molasses hogshead for a water-tank run up and down the road for freight and passengers. One of those indefatigable geniuses peculiar to the wilderness of Spottsylvania, becoming disgusted with the tardy movements of the railroad company, and fearing that his hoop-poles, if kept much longer on hand, would not be merchantable, conceived the novel idea of hauling them to town on a flat car drawn by a young bull. The car was loaded with 100 bundles of poles. There was some difficulty at first in teaching the bull exactly what was expected of him. The *modus operandi* was as follows: The bull drew the car up the grades, and was then unhitched and mounted on a platform at the rear of the car, which then ran down grade without help. As soon as his bullship got the hang of the thing, he took it very kindly, dragging the car up the grades with great alacrity, and evincing the same pleasure in riding down that is shown by boys who drag their sleds up-hill for the pleasure of sliding down again.



DINING CAR—MICHIGAN CENTRAL RAILROAD.

This car, designed by Mr. Robert Miller, of the Michigan Central road, is one of the first of this class of cars built in a road shop, and although still comparatively new, it has been the model upon which many similar cars have been built by railway companies for their own use within the past year. The engraving gives a view of the interior of the saloon looking toward the kitchen. In many of its important features this car is quite different from those previously built, several marked improvements having been made in the construction. The most noticeable change is in the relative proportions of the dining saloon and kitchen. Previously, the kitchen had been restricted to the smallest dimensions in order to provide for the greatest seating room at the tables. It was soon found that if a large number of persons was to be accommodated at the tables, it was necessary to have plenty of room for cooks and waiters, so they could work without being too much in each other's way. If the kitchen is too contracted, satisfactory service is out of the question. In this car the kitchen is large, and there is comparatively little crowding, and the saloon space is reduced to six sections or thereabouts. By this means people get their orders filled more rapidly and there is little grumbling on account of delay. Passengers wait patiently for their turn, knowing they will be better served, and that food can be better and more quickly prepared when the kitchen is not too small.

The interior finish of the car is plain, and for a good reason. It can be more readily and perfectly cleaned from floor to ceiling. There are no alcoves between the windows, such as have been put into many cars, for the reason that they catch the dust and are not pleasant on the road. There are no lambrequins, or rather the member which takes the place of the lambrequin is of wood, so as to be easily removed without throwing down a cloud of dust. As the car is cleaned throughout every day, the plain finish is a decided advantage, making the work easy and thorough.

The seats are upholstered with leather. The curtains go into a box which is movable and held in place by spring catches. The inside finish is oak. The head-lining is of quarter sawed oak of a handsome pattern. The tables are of cherry. The mirrors between the windows, and those in the ends and in the buffet, are beveled glass. The buffet arrangement, the mirror of which is seen through the open door, is double, so that the waiters pass in at the left and come out at the right in the engraving. The aisle or passage-way is on the right, so that, in coming into the dining-room, the passengers are coming in the same direction and not meeting the waiters. With this arrangement, too, the buffet hides the kitchen opening and also the sink and racks for the soiled dishes. As the waiters all pass in one direction coming in and out, they are not hindered by meeting each other.

A little very good carving has been placed in the car, noticeably that over the doors, and a rosette here and there has been introduced in the finish to relieve the severity of the wood-work. Each one of the sections of the head-lining has a fine border in colors, and the raised roof sashes are finished with handsomely embossed glass.

The Superintendent of the Dining-Car Department, who has had much experience with cars of this class, speaks of them with eminent satisfaction as more nearly answering all the demands that can be made upon them than any other car he has seen.

Old Cars with New Inside Finish.

Some of the old passenger cars of the Lake Shore & Michigan Southern road have been refinished in such a way as to make them as attractive and comfortable as new ones. Car No. 28 is one of them, and is a good example of this style of reconstruction. The upper part of the roof has a cloth head-lining grained and painted to match in color the lining of the lower deck. Crimson and gold ornaments are used, relieved by shaded green leaves. The whole pattern is bright and effective, and gives the car a cheerful appearance both in the daytime and at night. Leaf patterns are becoming very popular for head-lining decoration, and whether they are altogether conventional or natural, they are about as effective a design as has yet been used on natural wood ground. The autumn leaf patterns in these coaches have the advantage of giving the designer an opportunity to use colors on a ground which is usually somewhat difficult to ornament. The finish below is of cherry, with maple panels over the windows and ash between them. The window finish or molding is peculiar. It consists of a flat band with three hollow beads and broad chamfered edges. On this chamfer, and half an inch in from the edge, on parts where there is no chamfer, there is a broad, black line, which gives a good relief to the ash, and makes the whole finish very effective. A cherry strip, 3¼ inches wide, comes down in the center of the panel between the windows, and has a square rosette

at the top instead of being mitered into the horizontal molding. The sections of the molding are all very simple, and are similar to the one shown in the accompanying cut. The panels over the windows are not spaced evenly, each one extending over a window and a half. This is done to accommodate the old-fashioned ventilators in the letter board, which it was not thought best to remove. In the spaces between each pair of panels room is given for the ventilator. There are six of these on one side and seven on the other. The end ventilator in the raised roof over the door has a very fairly executed landscape painted in oil. In the ends of the car, the black line, which is carried everywhere through the moldings, is emphasized and made somewhat heavier than in some other portions. This gives relief and boldness to the door and end framing.

The Theory of the Stresses in Locomotive Coupling Rods.

[Paper read by Mr. F. W. Dean, at the Master Mechanics' Convention at Long Branch, June 18, 1884.]

Gentlemen of the American Railway Master Mechanics' Association:

A year ago I had the honor of reading before you a paper entitled "Improvements in Locomotives," and in that paper I touched upon the subject of coupling rods for passenger locomotives. I take the liberty of returning to that portion of the subject at the present time on account of the appearance in several technical journals of an article giving very fully a highly erroneous theory of the stress in those rods. The theory referred to (and which in this paper will be called the erroneous theory) in fact makes the stress only 50 per cent. [see Note 1 at the end of this paper] of the proper amount. This being so, evidently its use would greatly endanger life and property, and its refutation therefore is important. Moreover, it appears to me eminently appropriate to discuss the theory before the association most concerned in such matters.

Throughout this paper the locomotive is assumed to have attained a uniform speed.

The erroneous theory treats the subject from the standpoint that the coupling rod has a uniformly increasing vertical velocity from zero to a maximum and then to zero again, or in other words that it has a constant acceleration and retardation. If, however, we reflect that the changes in vertical velocity are identical with those which would exist if the engine were not moving as a whole, but whose wheels were revolving uniformly, it will be seen that the accelerations are not constant. For this reason the theory is incorrect, and the use of the formula

$$V = \sqrt{2\,g\,h}$$

(which is based upon the conception of constant acceleration) is irrelevant. Moreover this theory would have the rod most and equally in stress when at its mid-vertical, and highest and lowest positions, and equally in stress at all other positions, which is absurd. As will presently appear, the stress is a maximum when the rod is in its highest and lowest positions and a minimum when in its mid positions.

It is now necessary to seek a theory which is free from objections.

Through space, each point of a locomotive coupling rod describes a curve known to mathematicians as a *trochoid*. This is a curve generated by a point whose motion is composed of a uniform circular motion and a uniform rectilinear motion. Each of these components can be considered independently as a problem as this (vide Rankine, Weisbach, etc., etc.), for we must bear in mind that we are investigating stresses produced by motion only. Such stresses can only be produced by inertia. The force of inertia can only be made manifest by a change in direction of motion, or by a change in velocity. Our rectilinear motion is perfectly uniform; it can therefore produce no force of inertia and consequently can be entirely disregarded. It is therefore evident that we have only to consider the circular component of the motion, and we can therefore suppose the locomotive to be blocked up and turning its wheels at any rate we wish to consider.

The force developed, in virtue of inertia in a particle moving in a circular path is known as centrifugal force, the value of which is

$$C = \frac{W v^2}{g\,R}$$

in which

W = the weight (say in pounds).
v = the circular velocity in feet per second.
g = 32.2, the acceleration of gravity in feet per second.
R = the radius of the crank in feet.

As each point of the rod describes a circle with the same radius, this force acts on the rod at its mid-vertical position, and at *right angles* to it at its lowest and highest positions. If it were not for the weight of the rod, the latter two cases would be identical, but it is evident that in the latter the weight of the rod is subtracted from the centrifugal force, and that, when it is lowest, the weight is added to the force. The last is the maximum of all cases, and should be considered.

Finally, the rod is a beam supported at both ends, and uniformly loaded from end to end with the centrifugal force and its own weight.

Applying this theory to the solid rectangular rod assumed in the article under criticism, we have the following data:

No. of revolutions per minute	247
Radius of crank in feet	1
Resulting velocity of each point of the rod	25.8 ft.
Length of rod between pin centers, inches	108
Depth of rod in inches	3½
Thickness of rod in inches	1¾
Weight per lineal inch, in pounds	1.71
Total weight of rod between pin centers, pounds	185

Substituting the numbers in the formula for centrifugal force we have

$$C = \frac{1.71 + 670.8}{32.2 \times 1} 35.6 \text{ lbs.}$$

for each inch of length. For the whole length the centrifugal force is $35.6 \times 108 = 3{,}845$ lbs. Adding to this the weight of the rod, we have

$$3{,}845 \times 185 = 4{,}030 \text{ lbs.},$$

as the total transverse load to be supported. Placing this number in the usual formula for beams, the greatest stress per square inch is

$$f = \frac{3\,W\,l}{4\,b\,d^2} = \frac{3 \times 4{,}030 \times 108}{4 \times 1.75 \times 3.5^2} = 15{,}235 \text{ lbs.}$$

The erroneous method gave 8,120 lbs.

If we add the stress due to the cylinder pressure, the result is about 17,235 lbs., which is too great for practice. This is in accordance with our sense of the fitness of sizes, for I believe that no master mechanic would consider it prudent to use a coupling rod on a locomotive 9 ft. by 3½ in. by 1¾ in. As a matter of fact the stress would exceed 17,235 lbs. per square inch, for the load would deflect the rod one-third of an inch, and the cylinder pressure would act with this lever arm, tending to bend it still more. Of course there are various other accidental causes of stress.

The I form of rod described in the article under criticism weighs the same as the other, but is 6 in. deep, has flanges 2½ in. wide by ⅝ in. thick, and web ⅝ in. thick. Making the computation for this, the resulting stress is $5{,}380 + 2{,}000 = 7{,}380$ lbs. per sq. in. This is a good working rate, but none too small for such service. Comparing this with the stress of the solid rod, the benefits of channeling is very strikingly shown. The channeled rod deflects only $\frac{1}{16}$ in.

In conclusion I wish to say that I have prepared the two following formulas for practical use in computing stresses due to motion, on coupling rods, which I can confidently recommend.

(1) For rods with a rectangular cross section:

$$f = \tfrac{3}{4} W \left(\frac{1 + .0003406\,R\,n^2}{b d^2} \right) l$$

in which

f = greatest stress in pounds per sq. in., W = weight of rod between pin centers in pounds;
R = radius of crank in feet;
n = number of revolutions per minute;
l = length of rod between pin centers in inches;
b = thickness of rod in inches;
d = depth of rod in inches.

(2) For I section rods

$$f = \frac{\tfrac{3}{4} W}{a} \times \frac{(1 + .0003406\,R\,n^2)\,l}{a + 6\,\alpha}$$

in which

f = greatest stress in lbs. per sq. in.
R = radius of crank in feet.
n = number of revolutions per minute.
l = length of rod between centers, in inches.
d = depth of *web*, in inches.
a' = area of cross-section of web, in sq. in.
α = " " " " either flange, in sq. in.

F. W. DEAN.

NOTE 1.—Proof that a body of mass M with an acceleration p from a velocity o to velocity v through a space R in time t generates a force one-half that of the centrifugal force of the same body moving with a velocity v in a circle of radius R.

In the first case the force is

$$F = Mp$$

$$v = pt \therefore p = \frac{v}{t}$$

$$\therefore F = M \frac{v}{t} \quad (1)$$

In the second case the centrifugal force is

$$F = \frac{M v^2}{R}$$

$$R = \frac{p t^2}{2} = \frac{\frac{v}{t} t^2}{2} = \frac{v\,t}{2}$$

$$\therefore F = \frac{M v^2}{R} = 2\,M \frac{v}{t} \quad (2).$$

which is twice (1). Q. E. D.

Strong's New Passenger Locomotive.

Mr. A. Mitchell, the Master Mechanic of the Lehigh Valley road, has just completed at the Wilkes-Barre shops a new passenger engine from designs by Mr. Geo. S. Strong, of Philadelphia. The engine is a 4 coupled 8-wheeler, and is very large, weighing about 107,072 pounds, and is intended to haul heavy passenger trains at high speeds over the steep grade of the road. The tender weighs when full 70,000 pounds. The engine has 18 × 24 inch cylinders and 66-inch drivers, and is expected to be able to develop about 1,500 horse-power. This is to be obtained by several radical departures from the ordinary locomotive practice. The most marked of these is to be found in the cylinders and valves and the valve motion. The cylinder has a steam jacket and four plain independent gridiron valves working vertically. The port openings at full stroke are 30 square inches or ¼ more than the ordinary slide-valve, and as they are driven by ordinary rock shafts, they are almost at rest except when the ports are to be opened and closed. This reduces the wear and also the power needed to drive them. Steam and exhaust valves are worked independently of each other. By properly timing the opening and closing of the ports, nearly if not all the advantages of balanced valves can be obtained, as they can be moved in equilibrium in almost every case. The well known performance of these valves under very similar circumstances makes their performance on this locomotive hardly an experiment.

The valve motion designed by Mr. Strong, like that of Mr. Joy, does away with the eccentrics and is driven from the main connecting rod, but here the resemblance ends, as there is no sliding-block nor link, radius rods working on centers doing the work and moving the valves through rock-shafts. Steam and exhaust valves are driven independently and are controlled by separate levers so that the points of admission and cut-off, exhaust and compression, can be varied separately. There are two reverse levers, working together when necessary, but having quadrants by themselves and entirely disconnected. This arrangement enables the point of cut-off to be made as early as may be desired without rendering it necessary to alter the exhaust further than is needed to get the desired compression. The cut-off can be varied of course without making any change in the motion of the exhaust valves. The exhaust openings are very large and the nozzles of more than the usual diameter, which will reduce the back pressure and give a higher mean effective pressure in the cylinder. From this cause alone a considerable increase of power over a slide valve engine is anticipated. These advantages will be felt at very short points of cut-off, and even when following full stroke where the complete control of the exhaust will tend to make the engine "smart" by doing away with unnecessary pre-release.

The dependence for feeding the boiler is a vertical Worthington steam pump placed on the frame just behind the trailing driver. It delivers the water to the boiler through a heater between the drivers. This pump, and the Westinghouse air pump, both exhaust into the heater, and a portion of the exhaust from the cylinders can be sent in the same direction. This gives a considerable saving in a number of directions.

The boiler is 54 inches at the smallest ring, butt-jointed and double riveted. The fire box is 11 feet long, with a grate area of 37 square feet. There are 236 two-inch tubes. The total heating surface is 1,478 square feet. On the front end is a spark-arrester, designed by Mr. Mitchell, which does not increase the length of the smoke-box, but provides ample space for the accommodation of sparks in a box placed forward of the saddles and projecting a little above the top of the frames. Instead of netting, perforated iron is used for a screen, which has a double advantage in presenting less resistance to the passage of the gases than the ordinary netting, and in being cheaper. On the driving wheels there is a steam brake designed by Mr. Strong which is of very simple construction. The cylinder and one of the brake heads are in one piece, while the other head takes hold of the piston rod. The brake can be worked by steam pressure direct or with the air pressure.

The tender is a very heavy one, as a large supply of water and fuel has to be carried. The frame is of iron, as are the frames of both the trucks. The forward truck has four wheels, but the one under the back end has six, which gives the engine a somewhat peculiar appearance. All the truck wheels of both engine and tender are of paper. The load on the leading truck being somewhat larger than usual, the bearings have been increased accordingly, and, are 5½ inches by 10. The main bearings are 8 inches by 10. The wearing surfaces all over the engine have been made proportionally large in order that a high rate of speed may be maintained without difficulty.

The trial trip of the engine was made some weeks ago, and was unusually successful, being marked by an absence of those minor accidents and annoyances which commonly attend the first trial of an engine under steam. This was the more remarkable as the machine from the many peculiar features of its construction differs materially in methods of handling and adjustment from those of the ordinary type. The trip showed that the large exhaust passages were valuable. Much of the time the exhaust was so soft as to be imperceptible to the ear. The valve motion worked in a most satisfactory manner. Its handling presented no difficulties. As soon as cards can be taken, the valves set and the relation of the exhaust and steam valves determined for some of the most commonly used notches, the engine will be put upon the road to find out what it can do with the heavy express train on grades of 96 feet to the mile.

Since the above was written, the engine has made some experimental runs and cards have been taken to show the action of the valves at various points of cut-off. Their performance is quite as good as was expected. Their rapid movement, and the large port openings, prevent wire-drawing and practically back pressure also. Compression is under perfect control, and the cards, both singly and collectively, are very promising. The engine will be put into passenger train service at once.

Reduction in Railroad Freights since 1865.

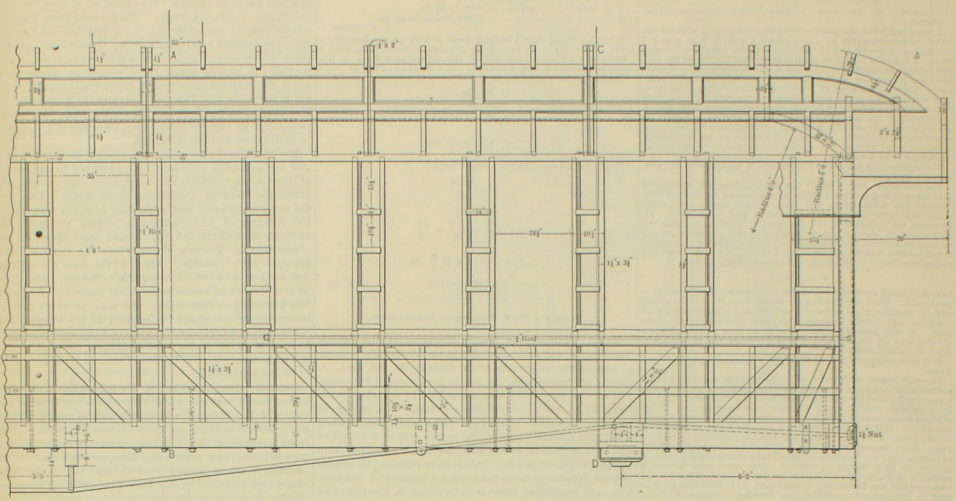
The following table, prepared by an officer of the Pennsylvania Railroad Company, will be found interesting. It shows the enormous growth of the freight business of that company since 1865, when 420,060,260 tons of freight were carried one mile, while in 1883 there were carried 2,996,892,567 tons one mile. In 1865 the cost per ton per mile for transportation was 2.665 cents, which in 1883 has decreased to 0.819 cents per ton per mile. A calculation computed on the rate of 1865 as compared with that of 1883, shows a total reduction or saving for the eighteen years of $438,270,113. It should be remembered, too, that the service of to-day is far superior to that of the period prior to the war, while the cost has been reduced to less than one-third that of a score of years ago.

Years.	Tons carried one mile.	Average rate per ton per mile (cents).	Reduction each year computed on rate of 1865.
1865	420,060,260	2.665	
1866	513,102,181	2.282	$1,965,181.35
1867	565,675,813	2.092	3,241,219.27
1868	676,775,590	1.906	5,129,198.50
1869	752,711,312	1.718	7,128,176.12
1870	825,979,682	1.549	9,217,933.36
1871	1,011,802,307	1.389	12,911,744.56
1872	1,190,144,036	1.416	14,864,899.01
1873	1,384,831,970	1.416	17,296,551.31
1874	1,372,566,976	1.255	19,358,194.36
1875	1,470,414,496	1.058	23,774,190.47
1876	1,629,742,021	0.892	28,895,326.03
1877	1,494,798,196	0.980	25,187,349.64
1878	1,732,003,131	0.918	30,358,094.70
1879	2,136,708,887	0.796	39,935,088.91
1880	2,598,317,323	0.880	41,024,964.22
1881	2,655,458,764	0.760	49,550,487.34
1883	2,870,542,701	0.817	53,213,949.11
1883	2,996,892,567	0.819	55,322,636.79
Total reduction for 18 years			$438,270,123.05

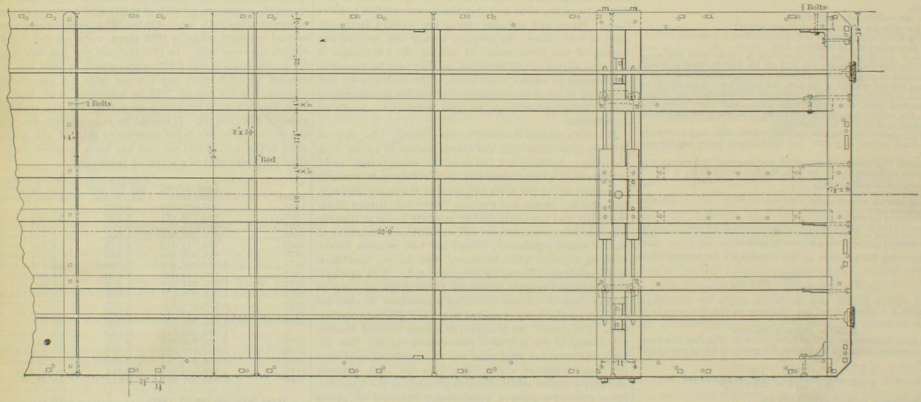
Notwithstanding the great reduction in the cost of carrying, the company has been able to get a fair remuneration for the service rendered.

THE iron frame steam derrick car of the Buffalo, New York & Philadelphia road, an illustrated description of which was published in the CAR-BUILDER for May, is performing much useful service every day in the track yards, and of a kind not usually performed by wrecking cars. Last spring a lot of old, worn-out car bodies were brought to the shops and piled up alongside the main track. In order to have them broken up it became necessary to remove them to a side track some distance off, and the derrick car was found to be a very effective and economical means for doing it. It was coupled to a switching engine and a steam connection made with the boiler. The connecting pipe, which was of iron, had three right angles in it so disposed as to obtain the necessary elasticity. The car bodies were picked up by one end, swung over the main track, and temporary trucks put under them, so they could be hauled to the side track, the time required to get a car body on the trucks being only five minutes. The dumping on the side track was done in about thirty seconds, the process consisting in hooking on to one side of the car, carrying the rope under the body, and rolling it over to the place where it was to be broken up.

STANDARD PASSENGER CAR—NEW YORK, LAKE ERIE & WESTERN RAILROAD.



Outside Elevation of Frame.



Floor Frame.

GENERAL DIMENSIONS.

Length outside of end sills	52 ft. 0 in.
Width outside of side sills	9 " 8 "
Height, top of sills to bottom of plate	6 " 11⅜ "
Center of bolster to outside of end sills	6 " 2 "
Length, outside of platform and timbers	58 " 4 "
Length of clear-story roof over end carlines	57 " 0 "

BODY TIMBERS (FINISHED SIZES).

2	Side sills	Ga. pine.	5½ × 8	in. × 51 ft.	0	in.
2	Center floor timbers	"	4 × 8	" × 51 "	0	"
2	Intermediate "	"	4 × 8	" × 51 "	0	"
2	End sills	Wh. oak.	7½ × 8	" × 9 "	8	"
2	Body bolsters	"	5¼ × 14	" × 9 "	8	"
2	Needle beams	"	4 × 8	" × 9 "	8	"
2	Truss planks	Ga. pine.	2¼ × 10¼	" × 51 "	4½	"
4	Corner-posts	Wh. ash.	5½ × 5½	" × 7 "	8¾	"
4	Door-posts	"	4½ × 4½	" × 7 "	8¾	"
88	Window-posts	Ga. pine.	1½ × 3⅝	" × 7 "	2¼	"
38	Studs	"	1½ × 3⅝	" × 2 "	⅝	"
40	Braces	"	1¾ × 3	" × 2 "	10½	"
4	Panel-rails	Wh. ash.	1¾ × 2	" × 51 "	3	"
8	" "	" "	1¾ × 2	" × 3 "	0	"
2	Belt-rails	" "	2¼ × 3¼	" × 51 "	3	"
4	" "	" "	2¼ × 3¼	" × 3 "	0	"
2	Window sill	" "	1¾ × 5¼	" × 51 "	3	"
4	" "	" "	1⅞ × 5¼	" × 3 "	0	"
2	Side plates	Ga. pine.	2¾ × 6¼	in. × 52 ft.	1¼	in.
2	End plates	wh. ash.	2¼ × 20⅝	" × 9 " 11		"

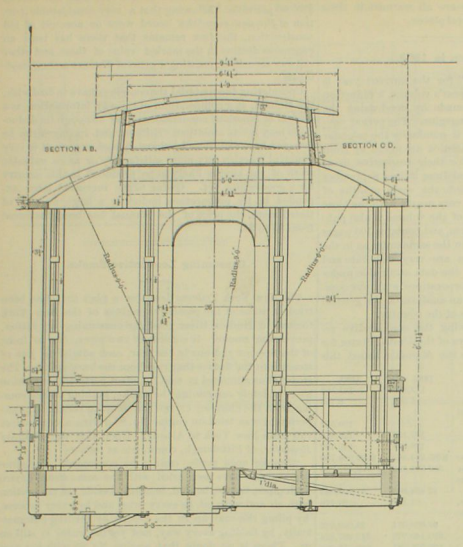
2 Clear-story side sills, wh. pine, 1¼ × 6 in faced, with ¼-in. wh. ash, making 1½ in. thick.
2 Clear-story end sills, wh. ash, 1¼ × 6 in. × 5 ft. ⅝ in.
2 Clear-story side plates, wh. pine, 1¼ × 4½ in. faced, with ¾-in. wh. ash, making 1½ in. thick.
2 Clear-story end plates, wh. ash, 1½ × 5¾ in. × 4 ft. 10¼ in.
40 Clear-story side posts, " " 1½ × 3⅝ " × 1 " 6 "
54 Rafters, " " 1¾ in thick.
32 " " " " 1¾ " "
47 Clear-story carlines, " " 1¾ " "
4 Clear-story end posts, " " 1½ × 3 in. 1 ft. 9 in.
4 Platform roof side plates, " " 1¾ in. thick.
2 Platform roof end carlines, " " 1¾ in. thick.
2 Platform roof carlines, " " 2 in. thick.

Flooring, double thickness; bottom layer, 1¼ in. white pine, about 5 in. wide, tongued and grooved, planed on one side, planed side up; upper layer, Georgia pine, not more than 3 in. nor less than 2½ in. wide, tongued and grooved and planed both sides; deafening ceiling, ⅜ in. white pine, 5 in. wide, tongued and grooved, planed one side, planed side down.

Roof boards, ⅜ in. white pine, about 4 in. wide, tongued and grooved, planed one side, planed side down.

This car embodies in its design and construction some advanced ideas which will commend it to the attention of railway men, and especially of car-builders. The main object in the style of finish, inside and out, and in the arrangement of the subordinate details of construction, has been to make every thing conform as far as possible to the requirements of the service. The external appearance of the car is very similar to that of the standard passenger coaches of the Philadelphia & Reading road, the corners being rounded and the sides and ends presenting as few projections as possible in the form of panels and moldings, the advantage of which is a somewhat less atmospheric resistance in fast running.

Vertical 2-inch sheathing is used on the outside, relieved only by the car numbers placed near the ends over the trucks. The windows are square headed, with fillets in the upper corners, as will be seen in Fig. 2, in which the form of sash is shown. The window opening outside corresponds to the sash. With the exception of the belt-rail, there are no outside projections beyond the eaves-drip and the thickness of the letter-board. The roof from end to end is straight and plain, and is continued straight out to form the hood, the only curve being in the bend of the raised roof at the ends. The hood, in plan, is rectangular,



Sections through A B and C D.

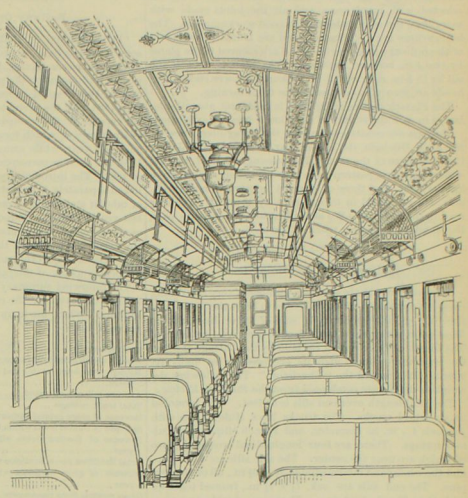
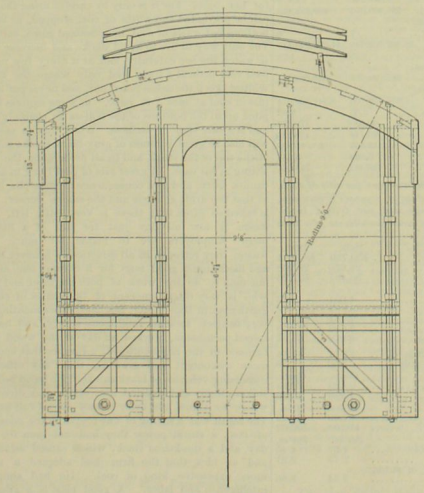


Fig. 1.



End Elevation of Frame.

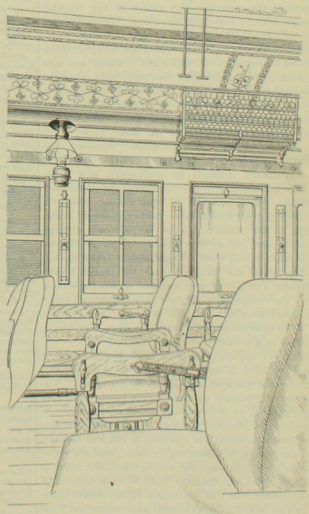


Fig. 2.

while the side view shows it as a plain continuation of the roof and letter board.

The style of the interior finish is shown in Figs. 1, 2 which are outline reproductions from photographs taken in the cars. Plainness and durability have not been lost sight of in a desire for showy elaboration, and the result is a pleasant, cheerful and attractive interior. Birch is used in the ceiling and white ash and mahogany in the sides, the ash being obtained along the line of the road of an excellent quality, light color, and free from blemishes. Upon these ash panels, which are absolutely free from streaks and hearts, is placed a belt of mahogany. Over the windows the mahogany is ornamented with a sunken rosette, and between the windows with a rosette and engraved lines, as shown. The birch ceiling is put in with mahogany moldings stained to represent old wood, thus affording a better contrast with the ash than could be obtained from the new wood. The window moldings are ¼ round of about an inch radius, presenting no sharp corners. The seat-arms are of ash, and are strong, shapely and handsome. The seats slide upon the frames so as to be lower at the backs than at the front edges. The roof curves have been carefully studied with a view to harmony between those of the lower and upper roof. The two cross sectional elevations show the points from which the curves of the carlines are struck, and also the radii. The effect obtained is that of an elliptical head, although the curves are struck from centres. The raised roof, in consequence of the thickness of its sides being only 1¼ in., is much lighter than usual, without any sacrifice of strength. The ash panels, only about ⅛ in. thick, are glued directly upon the rails and posts.

The side sills are fastened to the end sills by corner-irons and four ¾-in. bolts. There are double tenons on the side and intermediate sills, and the latter are fastened to the end sills by strap bolts. The bolsters are gained and housed to receive the sills and are trussed with four 1-in. rods, 9-in. centers, and held by flat 4-in. straps ⅝-in. thick. The rods have enlarged ends and pass through a plate washer ¼-in. thick, 3½ in. wide and 14 in. long. This form of truss is strong, easy to put in, and very effective, and is preferred to any other by those who have used it. The truss-plank is got out with a camber of 1¼ in. in 38 ft. 6 in., the distance between the body-bolsters. The ends are got out with a ¾-in. rise, which is taken out by bolting down to the floor. The plank is gained out ⅛ an inch for the posts and rests on the top of the flooring, to which it is held by 13 ⅝-in. bolts going down through the sill. The side framing is a combination of the wagon body system and the window truss. There are two rails, besides the belt or window rail, all of which are gained upon the posts and held together by two screws in each post. The side of the car as shown in the drawings stands well, and after years of service the walls show straight and true. The plates

are housed for the short carlines and the feet of the iron carlines. They are also mortised for the window posts.

The framing of the whole roof is more after the style of carriage work than car building, the timber being all selected with much care, and all the joints made with more than the usual attention to good workmanship. The iron carlines are ½ × 2 inches, and are bolted between two of the ordinary wood carlines and are secured to the plates by two ½-in. bolts on each end. The plate is held to the sill by 18 ½-in. rods with ⅝-in. nuts on the lower ends. The heads are secured to prevent them from turning.

The Pintsch system of lighting is used, and also oil side-lamps in case the supply of gas should become exhausted.

The cars are constructed under the superintendence of Mr. J. N. Mileham, the Master Car-Builder at the Jersey City car shops of the road. The passenger cars of the old wide-gauge Erie pattern were noted for their comparative light weight, and those of present construction are probably not surpassed in this respect by those of any other road in the country. We also illustrate on opposite page the standard passenger truck of the road.

Chicago & Alton Dining Cars.

This company has in service a number of very fine dining cars, the popularity of which seems to be on the increase on this line, and the same may be said of other lines at the West upon which this class of cars has been introduced. The fourth and last dining car built by the Chicago & Alton Co. is an improvement upon its predecessors in many respects. It is named the "Charleton." The following descriptive details are condensed from the *Railway Review*:

The total length over end sills is 65 feet. It is mounted on six-wheel trucks. The trucks have Muley axles with journals 4 5/16 in. in diameter, and French elliptic and Culmer springs. There are four longitudinal truss-rods, two of which are near the center. The side sills are 6 × 7½ in., and the center and intermediates 5½ × 6¼ in., all of Georgia pine. The end sills are oak, 7½ × 7½ in., framed together with 1¾ × 2¾ oak bridging. There are double transoms over the trucks connected by heavy iron arched bars. The cross tie-rods are ¾ in. The side posts are 5 × 4 in. and 6½ ft. between shoulders. The corner posts are of black walnut and clear white pine glued together, the walnut being on the outside and 2½-in. thick. The posts have a ¼ circle curve on the outside. The roof is of the regular arched design with an elaborate elevation. The side plates are 2 × 5¼ in. The deck sill is 2 × 4¼ in. The upper elevation plates are 2½ × 4 in. The carlines are all 1½ in. thick and are of the best quality of white ash. There are also eight ⅝ × 2-in. iron carlines. The floor is of 1¼-in. Georgia pine, dressed on both sides. The general dining-room is 35 ft. 8 in. in length, and contains ten tables 36 in. wide, with a seating capacity for 40 people. The windows are double-sashed and have 25 × 29 in. plate glass, with an upper section of 10½ × 29 in. glass. Between the windows are French plate mirrors. The whole interior is elaborately finished in mahogany and marquetry. The panels above the windows are decorated with lincrusta. At each end of the dining room is an exquisitely carved buffet, also corner lockers, China closets, etc. The chairs are of leather of a dark maroon color, and are in two parts. A novel feature about these seats is a system of ventilation from underneath. The tables are steadied and the table cloths held in place by a couple of attachments, which have been patented by the company. The racks for hats and other garments have been abolished, and in their stead railings are used. The interior of the elevation is New York birch, and is finished in a bronze color.

The kitchen is completely isolated from the interior of the car, and the odor of ham and eggs, when the passenger is demolishing quail on toast, will be kept out. The ice-box, which is arranged on a miniature track for convenience of cleaning, is divided into three compartments. The upper contains the ice, through which into the second connection is made by air chambers. In the second, directly in the center, is a hanging ice crate, and under the roof and sides are stationary hooks on which the meat is hung. Those who are familiar with the old method of ice-boxes in dining cars will appreciate this excellent innovation. In the lower compartment, also connected with the other by air chambers, are a number of drawers with glass bottoms, also for meats. The superiority of glass over the corroding galvanized zinc for this purpose is at once apparent. The Simonds range is used, and by means of a water-back, does away with the circulating stove. The hot ovens are arranged with sliding doors instead of swinging ones. Above the whole is a sheet-iron canopy, and so well regulated is the draft that smoke nearly a foot away from it is attracted. This is used for the conveying up and through the roof all heat and gases from the stove, thus precluding the possibility of any odor entering the car. The coffee urn and steam table is heated by the range. The dish rack, above the steam table, is fitted up with sliding doors and is air tight. These sliding doors are a great improvement when the economizing of space is considered. The kitchen door, Roberts' patent, ought to be adopted everywhere. It consists of panels and screens and a sliding attachment, and can be so arranged that a current of pure air can be made to rush in either at the top, bottom or center, at pleasure. The pantry is a model of conveniences, not an inch of space lost, and no confusion possible. The dishes are all warmed in their shelves and can be got at in several places.

Railway Operation in 1883.

"Poor's Manual of Railroads" for the current year is somewhat less bulky than last year's volume, a reduction of twenty pages having been made by condensing the matter and lessening the page margins. The period covered by the detailed operations is nominally the calendar year 1883, but the tabulated statistics are made up from the reports of the companies for their respective fiscal years, many of which terminated June 30 and September 30 of last year, while some run into the early months of 1884, the average corresponding very nearly with the close of 1883. The introductory part of the volume is also published separately in pamphlet form, and contains 100 pages of tabular statements arranged in the same order as in the last year's Manual. These tables are very elaborate and comprehensive, and contain all the data attainable under the existing relations of these corporations with our complex system of government, for an analysis of the general or local working of the railways of the country.

The following summary showing the comparative results of operation of the railways of the United States for 1882 and 1883, is made up from the Manuals issued this year and last:

	1882.	1883.
Total mileage	113,329	121,592
Mileage constructed within the year	11,591	6,753
Mileage completed at the end of fiscal years	....	120,552
Average mileage operated	107,158	110,414
Total track mileage	138,991	149,182
Increase of share capital within the year	$385,254,585	$207,024,759
Increase of funded debts within the year	352,544,496	219,497,060
Increase of floating debts within the year	42,404,965	61,199,383
Total liabilities per mile at close of year	61,342	62,176
Increase of gross earnings within the year	67,066,511	53,563,025
Gross receipts from passengers	202,140,775	215,287,824
Gross receipts from freight	506,367,247	549,756,695
Gross receipts from other sources	61,848,734	58,728,405
Total gross receipts	770,356,756	823,772,924
Net earnings	310,682,877	336,911,884
Increase of net earnings during year	24,929,109	21,461,082
Gross earnings per mile during year	7,377	7,461
Net earnings per mile during year	3,005	3,051
Dividends paid	102,031,434	102,052,548
Increase of dividends during year	9,687,244	21,114
Tons of freight transported	360,490,375	400,453,439
Average tons per head of population, about	7	8
Tons of freight transported one mile	39,302,209,249	44,064,923,445
Average charge per mile (cents)	1.20	1.24
No. of passengers transported, not including N. Y. elevated roads	289,190,783	312,686,641
No. of passengers transported one mile, not including N. Y. elevated	6,834,048,765	8,541,309,674
Charge per passenger per mile (cents)	2.86	2.42
Steel rail in tracks (miles)	66,690	78,490
Locomotive engines	22,114	23,823
Passenger cars	15,551	17,899
Baggage, mail and express cars	5,366	5,948
Freight cars	710,451	748,661

Comparative statement showing the averages per mile of stock, bonds, cost and earnings, percentage of expenses to earnings, earnings per passenger train-mile and per freight train-mile, per passenger-mile and per tonnage-mile, etc., for 1882 *and* 1883.

Per mile completed:	1833.	1882.
Capital stock	$30,759	$30,674
Bonded debt	28,650	28,268
Cost of road and equipment	55,461	52,726
Per mile in operation:		
Passenger earnings	1,951	1,926
Freight earnings	5,092	4,824
Gross earnings	7,461	7,377
Net traffic earnings	2,702	2,670
Percentage of expenses to earnings	63.78	63.61
Passenger earnings per passenger train-mile	$1.11	$1.14
Freight earnings per freight train mile	1.56	1.59
	Cents.	Cents.
Earnings per passenger per mile	2.422	2.514
Earnings per ton per mile	1.236	1.236
	Miles.	Miles.
Average distance per passenger	27.32	25.89
Average distance per ton	110.04	109.02
	Per ct.	Per ct.
Interest per cent. of bonds and debt	4.57	4.40
Dividends per cent. of stock	2.75	2.91
Interest and dividends per cent. of stock, bonds and debt	3.54	3.65

Owing to the absence of any uniform and rigidly enforced system of annual reports, in connection with the diversity in the termination of the fiscal year of the different companies, and in the local legislation of the several States with respect to railway regulation, it is manifestly impossible to arrive at any general results that are anything more than approximately correct. No amount of labor in the task of compilation can eliminate the elements of uncertainty in the data now attainable, nor can any deductions be made with any approach to mathematical precision in regard to all the financial bearings of railway construction upon the industrial prosperity of the country. All that can be known with certainty is, that a vast amount of fictitious capital has been created within the past few years in order to facilitate the construction of new roads, and that the nominal cost per mile of these roads on the basis of share capital and debt, is vastly in excess of their actual cost. The manual just issued estimates that the nominal cost per mile of the roads constructed within the last three years is in the neighborhood of $70,000, while their actual cost does not exceed $30,000 per mile. Allowing that a very considerable portion of the new securities issued were on account of old construction, the fact remains that there has been an enormous decline in the market value of these and other railway securities, creating a general distrust among capitalists.

Considering the material the compilers have to deal with, the Manual, as a compendium of railway information, is a marvel of laborious condensation, and although its deductions may invite ambitious criticism, and incongruities be detected here and there by sharp-sighted experts, it is very doubtful whether any more satisfactory or more valuable work of the kind is likely to be produced in this country for a good while yet. Owing to the increased labor expended in its preparation, including a large number of tinted maps, the price of the Manual has been increased from $5 to $6.

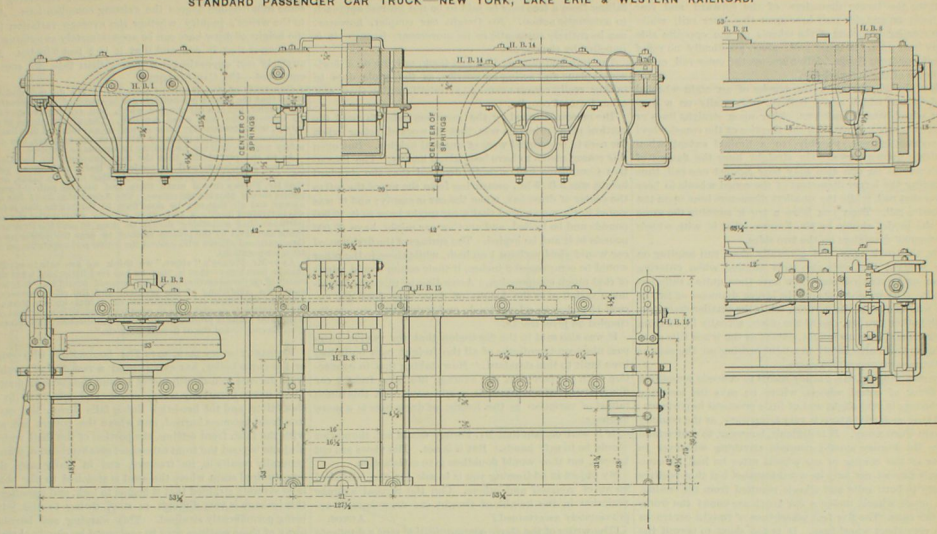
Consuming Locomotive Smoke.

The New York *Tribune* describes a plan that has been tried on some of the passenger engines of the New York Central & Hudson River road for consuming or, rather, preventing smoke. It consists of two pipes, one in front of the fire-box and one in the rear, each admitting jets of steam into the flames that rise from the burning coal. The steam thus admitted is said to effect perfect combustion by completely consuming the smoke, nothing visible coming from the chimney except the escaping steam. The experiment was tried on engine No. 85 during a continuous run from New York to Albany. Upon this the *Railway Reporter*, of Pittsburgh, comments as follows:

"Smoke once made, cannot be consumed. The same experiments have been tried with the same steam device with pipes, before, behind, beneath, beside, in connection with air and with oil, in every way and by every process, by piling the coal up in the centre, by feeding automatically, by feeding every way, and yet the curse is still on us. There is no doubt that engine No. 85 with her new steam appliances made a trip with very little smoke, because all attention was attracted to her at that particular time, and all hands did their best to keep down the smoke and give her every care. The fireman watched his fire as he had never watched it before, and fed it more carefully than he had ever done, and cared for it like a mother for her babe. For it is only by careful firing that smoke can be prevented and waste of coal stopped, as smoke is nothing but waste of coal, unconsumed gases, carbon, etc. The only way to fire to avoid smoke and increase steam is to watch the fire carefully, look at it every few moments, feed very little at a time, feed only where the fire is the whitest; keep the ashes raked out, and never put in a great pile of coal at once "to bake," as some express it. Coal piled up to the bottoms of the boilers is shameful waste, and is a sure sign of laziness. When that is seen, there will also be great volumes of gray-black smoke rolling out of the top of the stack, and in all probability the fireman sitting at his ease. A great pile of coal lying in a furnace cannot burn, and as a consequence firemen pile in more, so that the draft gets less and the smoke denser, the fire is raked so often that there is very little left, and the steam is low all day just for lack of a little judgment. Employers are to blame for much of this waste; they retrench in all directions whenever they can, and discharge a good man for a cheaper one, and allow one man to do the work of both engineer and fireman, who is very often ignorant of the duties of either. A gentleman in Manchester, England, experimenting on this very subject, took an intelligent stoker, and having obtained permission, worked all day at the worst smoking furnace in the neighborhood, a furnace that had caused more discontent and growling than any other, by its increasing volumes of black smoke. He stood beside that stoker all day and assisted him often, and directed him where to throw his coal, a half shovel-full at a time. The result was a saving of one-fourth in the consumption of coal, a steam power they had not seen for many a day, and a smokeless stack, which caused astonishment and an idea that the firm had adopted a new and more expensive kind of coal. He had simply used intelligence and labor. A good blast is a great assistance, but ordinary steam used as a blast is too wet and will reduce the steam. If the steam pipes were to be carried through the fire and the steam thus superheated, it would make a good blast, otherwise great care would have to be used, or the steam in the boiler would go down from too much moisture under the fire. Smoke cannot be consumed, but it can be prevented.

THE Chicago, Burlington & Quincy Railroad Co., is testing an arrangement for destroying weeds adjoining the track. It has been fitted on an engine at the Aurora shops and consists of two iron pipes projecting on each side of the engine in front. The exhaust steam is conducted into these pipes instead of through the smoke-stack, and the steam and gas are thereby thrown out close to the track in front of the engine on each side. On a trial trip weeds and grass were cut down and destoyed some 2 feet on each side of the rails. It is proposed to run an engine over the entire road in this way.

STANDARD PASSENGER CAR TRUCK—NEW YORK, LAKE ERIE & WESTERN RAILROAD.



The leading features of this truck are so clearly shown in the engravings that but little explanation is needed. Allen paper wheels (33-inch) are used, parallel in the tread and coned beyond. French's quadruple elliptic springs, 36 inches between centers when weighted, are used under the bolsters, and Vose's 8-inch graduated rubber center spirals on the equalizers. The axles are of hammered iron, of the road's standard pattern, and taper regularly from wheel fit to center. The eyes for check-chain hooks are made in the ends of the corner-straps, as shown, the object being to get the points of attachment as far from the truck center as possible, for the sake of leverage, and at the same time obtain a secure fastening to the timbers. The chains are ⅜ inch, and are attached to the sides of the car by wrought-iron plates held by ¾ inch bolts. The safety-beams are not made as deep as usual by blocking down, but a pair of straps surround the axles and are supported by cast iron thimbles over the bolts. This gives an iron surface both above and below the axles, making it practicable to use the upper strap as a bearing in case of necessity, a thing which can hardly be done when the axle rests upon the wood. The letters *H B* with the contiguous figures, where they occur in the cuts, indicate the method of the road for making castings, the numbers being progressive from 1, which is the pedestal, 2 the journal box, and so on. All the wood-work of the truck is white oak, except the brake-beams, which are hickory, and doubtless the toughest and best timber that can be had for the purpose.

The following are the pieces and dimensions of timber (finished sizes) for one pair of these trucks:

4	Wheel pieces, wh. oak	4½	×	9	in. ×	11 ft.	0 in.
4	End pieces of frame, wh. oak	4½	×	5½	" ×	7 "	2½ "
8	Safety beams, wh. oak	3½	×	5½	" ×	4 "	4 "
4	Transoms, wh. oak	4½	×	9	" ×	6 "	2 "
2	Truck bolsters, wh. oak	8	×	16	" ×	5 "	5½ "
2	Spring planks, wh. oak	3½	×	16	" ×	5 "	5½ "
4	Spring blocks, wh. oak	1⅞	×	16	" ×	1 "	0 "
4	Brake-beams, hickory	3½	×	8	" ×	5 "	6½ "

A Cylindrical Steel and Iron Passenger Car.

The July CAR-BUILDER contained the material portion of a printed circular issued by the Robbins Cylindrical Steel Car Co., of Boston, Mass., setting forth the claims made in behalf of a car of this description which is now being constructed by that company. We have recently received from the company a more detailed statement of the form and dimensions of the car and the leading peculiarities of its construction, prepared with the view of submitting it to the Car-Builders' Association at its last annual meeting. The following synopsis of this statement will be interesting to those who believe in the practicability of metallic passenger cars:

Form and Dimensions: The form of the car body is cylindrical, or nearly so, which gives the car greater strength, without the additional bracing of beams, posts, rods, etc., required in the rectangular form. The strain comes upon all parts of the structure alike, bottom, sides and top. No trussing is required, a car of this form being a truss in itself. A certain amount of bracing is used in the form of ribs in the inside placed 7 or 8 feet apart to add stiffness and keep the thin plates of steel in position. These ribs are hollow on the outer side, or next the shell. The width of the car in its widest part is 10 feet over all, and allowing 6 inches on each side for interior finish, leaves a space of 9 feet in the clear. The floor line is 8 feet wide, and the height 8 feet between floor and face of ceiling. The body of the car now being built is 54 feet long.

Material: Tank steel varying from ⅝ inch thick to No. 18 wire gauge, and tee and plate iron of similar dimensions. The bottom plates of the car are ⅝ in. thick, running the entire length, to which on either side are riveted ⅞ in. plates, and to these in turn ¾ in. plates extending to the top of the car. The monitor top, which is used as a ventilating shaft, is composed of plates of steel No. 18 wire gauge. Between the floor and the bottom plates are four keelsons, two of them double or V-shape, and two single, made of plates of steel No. 4 and 5 wire gauge in thickness, and from 6 to 14 inches in depth. The double ones extend only the length of the car-body, but the single ones are prolonged by ⅝ in. plates 6 in. deep at each end for platform supports. Transverse keelsons, of No. 5 wire gauge, are placed about 9 ft. apart, and put in so as to present the greatest resistance to pulling and pushing strains and to concussion. The floor is of ⅞ in. steel plates, secured to the top of the keelsons. The construction below the floor line is such as to thoroughly brace and strengthen the car and keep the preponderance of weight to the lowest point practicable. The part above the floor is light, substantial and durable, but of such shape and form as to aid in sustaining the whole structure instead of being so much dead weight.

Heating, Lighting and Ventilation: The heating is by furnaces outside and underneath the car, air spaces being provided for the warmed air, and pipes for conveying it into the interior, where it can be regulated by registers. Ventilation is provided for by taking air into the monitor top through wire gauze under the platform roof at the forward end, passing it down through the hollow ribs, already referred to, to the space beneath the floor, where it is warmed in winter by contact with the furnace pipes, and thence passing into the car through registers and out through the roof ventilators. The lighting can be done as now, by oil or gas.

Interior Decoration: This will consist of upholstery made upon woven wire frames to conform to the shape of the car, and in sections of suitable size to be easily removed for cleaning. These sections will be about 6 inches thick, and will consist of a layer of felt, which, when in position, comes next to the shell of the car, then the woven wire, and upon this a layer of hair worked in plain panels, tufted, knotted, etc., and finally by the upholstering material, whatever it may be.

Other Features: The platforms will be constructed so as to be compressible by taking a bearing upon springs. Not a particle of wood is to be used in the entire construction of the car body. The total weight of the car when completed is estimated at 44,000 pounds. The cost will of course be very much more than that of a car of the same kind built with suitable machinery appliances, instead of hand-work.

THE East Buffalo shops of the New York Central road have a well organized service for extinguishing fires. On one side of the shop yard is an excavated underground tank or reservoir, 100 feet long, 20 feet wide and 10 feet deep, the sides and ends being walled up and cemented. This is always kept full of water. From this reservoir a portable tank mounted on trucks is supplied and kept in readiness for an emergency, in which case it can be taken to any point where it is wanted by a switch engine. This supplementary tank is 34 feet long, 8 feet wide and 10 feet high. At every rain-water leader, and at other places on the premises, are placed old oil barrels, painted red, which are kept full of water. Their color makes them conspicuous, and the men become familiar with their position. Fire buckets are also provided in sufficient numbers, so that water can be promptly applied should a fire break out in any part of the shops.

DOES the piston stop at the end of the stroke? Certainly it does, or the stroke couldn't have an end. How long it stops is another matter.

Communications.

The Coning of Car Wheels.

To the Editor of the National Car-Builder:

A railroad man told a St. Louis *Globe-Democrat* reporter last winter, that the queerest thing about the Texas & St. Louis narrow-gauge road, of which Col. J. W. Paramore is President, was that every wheel on the line was flat, that is, that the wheels were not coned, or in other words, beveled from the flange outward. The railroad man also informed the reporter that such wheels would go around curves at first, but after a while the flanges would get sharp, and sometime, striking a curve at full speed, would, aided by centrifugal force, go off the rails and ditch the train.

The reporter then went to see Col. Paramore about the matter. The Colonel said there were too many people in this world who could never get old-fogy ideas out of their heads; that the coned wheel fallacy had been exploded for some time; that the flat wheels were the most economical for use on a narrow gauge road, because the wear is distributed evenly over the whole surface of the rail, whereas, on a standard track where coned wheels are used the whole wear and tear on the surface of the rail is indicated by a long bright line, at which place the rail splits or wears out. It is difficult, however, to understand where there can be any difference between the working of a flat or cylindrical wheel on a narrow gauge from the working of the same on a broad gauge. In fact, there can be no difference. Width of gauge has nothing to do with the matter.

Besides the Texas & St. Louis narrow-gauge, Col. Paramore said the flat wheels were used on the West Shore road. It has also been stated that they have been in exclusive use on the Old Colony road for several years; but the Colonel gets considerably off the track when he says the coned-wheel fallacy has been exploded. That is not so by a "large majority." Wheels are still almost universally coned, and the utility of such coning is as much a subject of discussion among railroad men as it ever was. That fact is, however, no news to the readers of the CAR-BUILDER, and I notice with interest, in connection with the subject, that Mr. M. N. Forney read a lengthy paper at the meeting of the Master Car-Builders' Association, in June, on the "Relation of Railroad Wheels and Rails to each other," and in which the utility of coning car wheels was very fully considered.

It was claimed in that paper, as I understand it, that a four-wheeled truck with coned wheels would run in a curve whose radius is proportionate, not to the difference in diameter of the surfaces of the tread bearing on the rails, but to the length of wheel-base; and that a four-wheeled truck, with a five-feet wheel-base and wheels coned according to the prevailing practice, would tend to run in a curve of nearly a mile radius, this being demonstrated by a model of a four-wheeled truck having wheels without flanges and of a larger diameter on one side than on the other, and which was exhibited in action at the meeting. It was thus demonstrated that the coning of wheels under

trucks of eight wheeled freight cars, so that in traversing curves the larger diameters of the forward and rear wheels on one side may bear upon the outer rail, while the smaller diameters of the wheels on the opposite side may bear upon the inner rail, gives practically no relief whatever from flange friction against the outer rail, or the slipping of the outer wheels.

But the wheels under the trucks of an eight-wheeled freight car, which are, I believe, universally on a five-feet wheel-base, do not run, either upon straight lines or curves, in accordance with the theories of the coned-wheel advocates, except, possibly, to a limited extent when entirely upon a curve. On straight lines the flanges of both wheels on one side may bear against one rail, thus bringing the larger diameters of the coned wheels to bear upon that rail, while the smallers diameters bear upon the opposite rail. Then you have a truck running the same as the model shown by Mr. Forney—that is, with wheels of unequal diameters on the two sides.

Or, the truck may, and generally does, run angling on the straight line, as it also runs angling when entering upon or leaving curves. You have then quite a different result. The weight rests on the larger diameter of two of the wheels at opposite corners, while the smaller diameters of the other two are, one or the other, actually lifted from the rails and bear no weight, except as the truck tilts so as to bring them alternately to a light bearing on the rails at the other two opposite corners.

In summing up, Mr. Forney seems to concede something in favor of coned wheels, where he says the resulting advantage is very slight and of little practical importance; and that such advantage is very temporary, as the conicity is soon worn away. It is difficult, however, to understand why Mr. Forney should concede anything whatever in favor of the coning of car wheels after he had so completely proved, not only its worthlessness, but that positive injury to both rails and wheels resulted from the coning. The more wheels under a car truck are coned the worse the car runs. The five-feet wheel-base of freight car trucks is a very short wheel-base. It is too short to permit the truck to run straight, especially when the car is heavily loaded, and it is particularly noticeable in many cases that the trucks of a heavily loaded car can not, after leaving a curve, get straightened out so as to run freely on the straight line. The coning makes it all the worse for the truck in that position.

There is, however, a matter to be considered in connection with the use of cylindrical wheels under existing conditions. Rails are crowned, and under the wear of coned wheels, now in such general and universal use, become beveled on the inside. Of course a cylindrical wheel running upon a rail in that condition would have only a narrow bearing on the rail, and that on the outside. The cylindrical wheel might thus get rapid wear and appear at a disadvantage.

It would seem that even on a new rail, owing to its crowning shape, the cylindrical wheel would have so small a bearing as soon to be worn to the shape known as a "hollow tread." The width of the cylindrical surface of the tread of the proposed standard wheel shown by Mr. Forney is 3⅜ inches, and its practical bearing surface may be stated as over 3 inches in width. The bearing of this wheel on the top surface of a new rail would be only ⅛ of an inch in width, and this width would not be increased to two inches until the top of the rail had worn down more than ¾ of an inch. Why should wheels be worn to a hollow tread in order to get this unnecessary crown out of the rail and give a reasonable amount in width of bearing surface for the wheel? New rails ought to have bearing surfaces equal, at least, to two-thirds of the width of the cylindrical wheel tread. C. B.

NEW YORK, August 21.

Car Coupling and Height of Draw-Bars.

To the Editor of the National Car-Builder:

It is understood that one of the practical results of the meeting of the Master Car-Builders' Association at Saratoga is, that an effort will be made to have a general test of freight car couplers under the joint direction of the Secretary of the Association and the railway companies.

Before this testing takes place would it not be desirable that the subject should be more fully discussed in the columns of railway journals than was possible during the brief time that could be devoted to it at the Saratoga meeting? As appears from the reported proceedings, the members who took part in the coupler discussion were but a comparatively small number of those in attendance, and judging from the conflicting character of the resolutions that were adopted, some of those who did speak must have done so without due preparation.

One of the resolutions was to the effect that the best coupler, mechanically, is one that will operate along a vertical plane. Now, in view of the fact that the railway companies are on the lookout for the best "automatic" freight car coupler, it would appear that this resolution was passed without much reflection. Strictly speaking, an object that moves automatically must move from its own impulse, or in other words spontaneously. An apple falling from a tree may be said to be the nearest approach to automatic action. No freight car coupler, however, can be entirely automatic in its movement, because it is impelled by the engine.

The link-and-pin, or link-and-hook, moving on a horizontal plane and acting by gravity, as the apple does in falling, really comes nearer to automatic action than any other form of coupler.

The reason assigned by the members who favored the vertical plane principle was, that it worked better when the cars to be coupled were of unequal heights. But even this reason seems to have been given hastily. The Executive Committee had already declared that the standard height was 2 ft. 9 in., measuring from the top of the rail to the center of draw-bar, when the car is empty; and it was stated in the convention that a car might have in it 10,000 pounds and be loaded, and another car might have 60,000 pounds in it and be loaded. The springs of the first-named car would yield perhaps ¼ an inch, while those in the other would be compressed 2 inches, if their action would admit of that much compression. According to this, the maximum variation in the height of draw-bars does not exceed 1¼ inches on a level track, and freight cars are usually coupled on level tracks.

It was also said in the discussion that for twelve years past nineteen-twentieths of all the freight cars built had been built to this standard. Now, taking this in connection with the fact that the average life of a freight car does not exceed ten years, it would seem that this much talked of variation in the height of draw-bars is a mere bugbear.

If it were certain that Mr. Forney would act, the matter would be in safe hands. But it is not. His views are not known, but they would doubtless give satisfaction.

My object in addressing you is to ask for the published views of yourself and others. Can the present average variation in the height of freight car draw-bars be approximately ascertained? AUTOS.

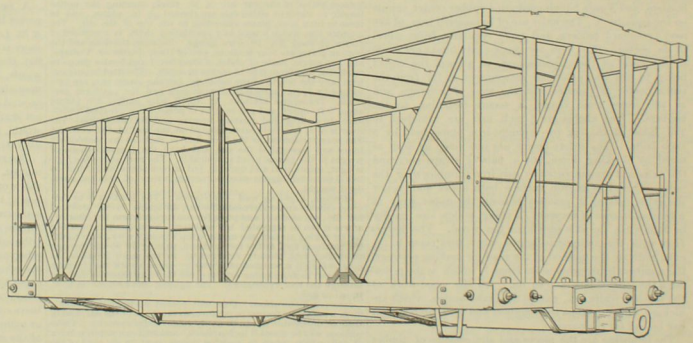
[The writer of the above communication sent a duplicate of it to the *Railroad Gazette*, in which it was printed Aug. 8, with some appropriate comments which we copy below. The writer asks for our published views on the coupler question. We are sorry to say that we have no views upon it that we consider worth publishing, and if we had, we should not care to inject them into the present seething turmoil of opinions and interests for fear of increasing in some infinitesimal degree the existing complications. As to the writer's inquiry whether the average variation in the height of draw-bars can be approximately ascertained we answer that it can, and that it is 2 feet 9 inches. If anybody can approximate it nearer than this, we stand corrected.—ED. CAR-BUILDER.]

Comments of the Railroad Gazette: "We do not understand that the master car-builders are in search of an *automatic* car-coupler, but of a car-coupler which will not require men to go between the cars when coupling. The object aimed at is safety, not automaticity, labor-saving, or anything of that kind. All automatic couplers probably will be safety couplers, but all safety couplers will not necessarily be automatic couplers.

As to the probability that the tests proposed by the Car-Builders' Association will be made, we learn nothing as yet. The Association has expressed a desire that they be made, and that Mr. Forney should make them, and that the railroad companies should provide the means. The Association itself has no means, and all that can be done now to further its plan is for the individual members, and other persons who realize the importance that something should be done to save the lives and limbs sacrificed by the present method, to urge the matter upon those railroad officers who control the action and expenditures of their corporations.

As to Mr. Forney's "views," we think we are safe in saying that he hasn't any—that is, that he has very little idea what the result of an investigation made by himself would be. It is because the conditions of the problem and the effectiveness of different appliances are so uncertain, or so little known, that an investigation is needed. As to whether coupling in a vertical or horizontal plane is preferable, he would doubtless have an opinion after having tested the different methods."

PROBABLY every man, says *The Locomotive*, who owns or has run a boiler, has experienced a vast deal of trouble with the cast iron-mouth-pieces around the furnace doors. These pieces invariably warp, crack and burn out in a short time, and the fire-brick lining falls down, the cast-iron front becomes burned, and where the boilers are set with the flush front setting, the portion of the shell which projects beyond the front tube-sheet gets overheated, which generally results in its fracture, and in many cases the longitudinal seam where the head is attached to the shell is so severely strained that it begins to leak, and sometimes this leakage is very difficult to stop, owing to the joint being permanently strained. This warping and burning away of these castings may be prevented by simply slitting them back from the edge for about one-half their depth. The slots should be from one-half to three-fourths of an inch in width, and may be from eight to twelve inches apart over the furnace door. This width is necessary, as they close up gradually under the influence of the intense furnace heat.



Box Car Framing.—Chicago, Rock Island & Pacific R. R.

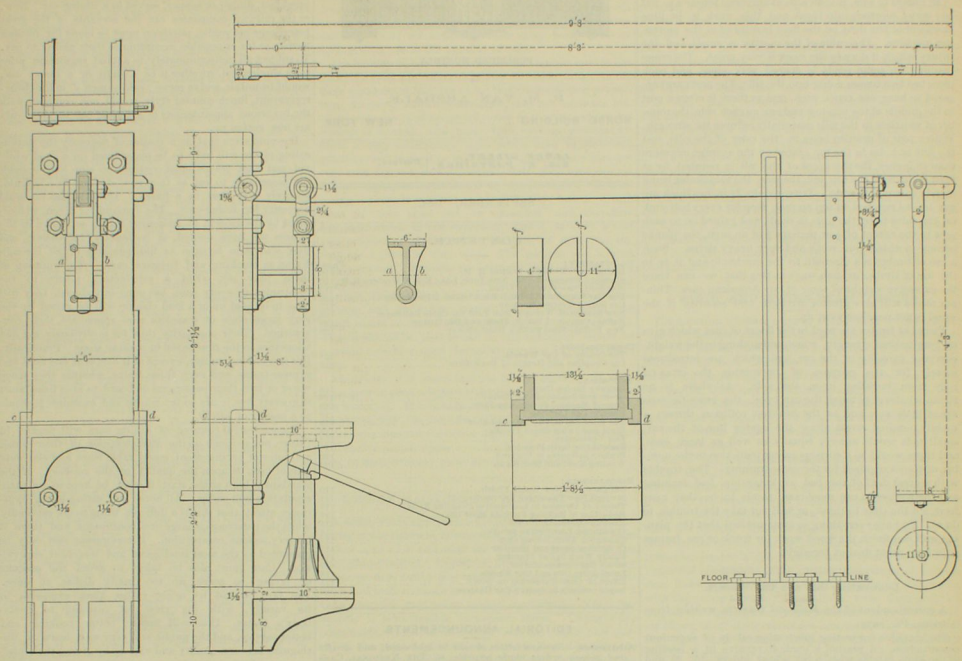
The engraving (produced from a photograph taken in the shops) illustrates the style of framing for box cars adopted by Mr. Verbryck, the Master Car-Builder of the road. The dimensions of the principal timbers are as follows:

Side sills, 4½ × 7⅞ in.; center and intermediate sills, 4½ × 7⅞ in.; corner posts, 3⅞ × 5 in.; end braces, 2½ × 4 in.; braces from bolsters to doors, 2½ × 8 in.; braces from bolsters to car ends 2½ × 6 in.; plates, 8 × 6 in.; rafters, 1¾ in. thick, 9½ in. wide.

This framing, as will be seen, differs in many respects from that of ordinary box cars, and especially from the styles that are generally used upon Eastern roads. Its chief peculiarities are in the sides of the car, or truss. From the bolster, one brace runs to the door post and another to the corner of the car. The post is placed directly over each bolster. In the ends of the car there are two braces starting from the lower corners and running to the center of the end plate. This, of course, makes a very simple frame, the braces taking the place of the posts in stiffening the sides of the car. A half-post midway between the bolster and end of the car extends to the brace, to which it is nailed fast. Another similar post is placed midway between the door and bolster.

In designing this car, Mr. Verbryck has kept in mind that heavy loads must be carried, and that a comparatively small amount of work can be got out of the truss-rod for holding the car up. The question then was how to give the frame the greatest amount of support to secure the walls from bulging in or out, and make the construction as simple as possible. In transmitting the strain produced by the load from the center of the car to the bolster, it was desirable to have it pass through as few joints as practicable; hence one brace would be better than two, the inevitable slackening up of the joints being only half as much with a single brace as it would be with two.

The advantages of this method of framing have been tested by service. Cars of this description that are in the shop for repairs, after being a long time on the road, hold their camber better than cars of a different construction that have performed similar service. The superiority of braces over rods is plainly evident whenever old cars having braces and brace rods can be found together. The rods do not prevent sagging, but a single brace in many cases holds the car up until it is fairly worn out. A further advantage of this construction is, that with washers of a proper size, the rods next the door posts when screwed up will restore the original camber without throwing any undue strain on any member, and without slackening up any of the braces. This system of bracing is well adapted to resist buffing strains, and the house or box part of the car would seem to meet all the requirements set forth in the report of the committee of the Car-Builders' Association on the subject of freight car framing. The question has, in fact, been raised by engineers, whether longitudinal truss-rods are of any advantage to a freight car body constructed of dry and sound timber and put together on approved mechanical principles.



CAR TESTING MACHINE.

This machine was designed by Mr. J. D. McIlwain, of the car department of the Grand Trunk Railway, London, Ont. It is very simple in its construction and was built in the shops of the company at comparatively small cost, the long lever and sundry other parts being made from scrap, old axles, etc. The hydraulic jack for raising the spring table is an old one that had been condemned as unfit for car work, but was fitted up and utilized for the tester.

The bed-plate casting is 6 ft. 10½ in. long, 18 in. wide, 1¼ in. thick, and of channel iron shape. This is bolted to a stick of timber 4 in. thick, and the stick is bolted to a solid part of the shop wall, an arrangement that is much cheaper than an elaborate special frame, and quite as effective. The table for the jack is cast on the frame and is supported by three brackets. The table and its guides are shown in section, and are made so that no adjustment is needed, the table slipping down in place from above. The lever is 9 inches between the eyes and projects 99 inches, making the ratio between the weights and the pressure upon the spring 1 to 10. The pin which forms the fulcrum for the lever is 1¼, and the pin over the plunger 1¼ in. in diameter. At the outer end of the lever a guide is made by bending a flat bar of iron into a U shape. The lever and rod throw a weight of 2,000 pounds upon the spring. Two thicknesses of weights are used, each 11 in. in diameter, one of which is 4 in. thick, and is equivalent to 1,000 pounds on the spring, and the other 2 in. and is equal to 500 pounds on the spring.

The machine is not patented, and Mr. McIlwain has already furnished several blue prints to parties who have seen it in operation, and desire to equip their shops with a similar one.

Street Car Ornamentation.

The imitation of inlaid woods has become quite popular among some of the painters in car shops, it being a simple and quick means of filling up a panel with fancy designs. To do this work select the whitest wood possible—white holly—for the panel in the first place, then, cleaning and smoothing it nicely with very fine sandpaper, put on a good coat of French shellac varnish sufficient to partly fill the pores in the wood; begin the running in of vines, leaves and buds, or whatever is desired, using any color preferred, mixed with gum water (virtually water-color), the usual ornamenting pencils, until the design is complete. Let it dry, which will not take long, then with black walnut stain, or black, mixed with varnish, oil and turpentine, go carefully over the whole panel, flowers, vines and all, being careful not to run over the moldings around it. Allow the stain to dry, then with a soft sponge and water wash off the gum or water-color paint, which will be found to soften easily and come off, leaving the figure clearly defined, with neat and true edges in white holly upon the walnut ground. When all is cleaned varnish the work as usual.

Some very handsome work is made by first stenciling the pattern upon the wood, instead of doing it by hand, which is, of course, much less expensive, for time is saved. However, hand-work is always distinguishable, and by many better appreciated.

Another way to produce a similar result is to first put on the design as before, then to stain-grain the panel to imitate a darker wood, using oil graining color, then wash off as described.

Bouquets of flowers are very much liked by some of the railroad magnates—for it is generally their privilege to choose from many designs what shall be used—and some newly built cars of the Sixth avenue road have over fifty panels (inside) filled with bunches of roses, violets, etc., in all their natural colors, and many of them are strikingly beautiful and true to nature.

The advertising cards once so prominent are becoming less so, and the ornamentation of belt panels is taking their place, which is by far more pleasant to the eye of the traveler, at the same time furnishing work for skilled workmen.

The outside panels are now made more elaborate than heretofore by good scrolling. Some cars in Brooklyn are very neatly and richly ornamented on the corners and center panel with Roman scrolls, the car number being put on in the second panel from either end.

One of the troubles which beset the street car painter, if he be a thorough artist and understand harmony of colors, is the arbitrary rule laid down for him by an ignorant superintendent, and when one sees a car with blue panels, striped with green, or red lettering upon a blue ground and *vice versa*, he should not give all the discredit to the workman—poor fellow, he can't help it.

The half-block octagon letter is the plainest and easiest to make, and is used somewhat extensively, but as a general thing the full block letter, approaching in shape the Roman letter, will be seen on most work.

Many car letterers lay out their lettering with a rod or long straight-edge, having marks upon it to show what distance to give, but where there is a continuous job on one line of road, or where many cars are to be alike, a pounce pattern is certainly best. The heavy drafting paper, which comes in rolls, is the kind used, and a pattern once made with care will last many years. Of late, owing to rivalry in the paint-shops, some lines have their cars elaborately lettered, but the majority of the cars in this city are very poorly lettered. The colors employed are in most cases inharmonious, and the letters appear bungling and out of proportion. Brooklyn cars, however, are in these respects far superior to those of New York, and some done by M. Fiegel & Son, of New Utrecht, L. I., are marvels of gracefulness and beauty in both lettering and ornamenting.

A correspondent from London, England, wants to know if the street cars in New York are painted in the same manner as the steam cars described in our trade journals. The answer is, No! There is a difference. Most steam cars are rough-stuffed and rubbed, while such a thing is seldom thought of in a street-car shop. A coat of priming—possibly white lead and oil—two coats of white having but little oil, then the color; next, color and varnish, striping, ornamenting and lettering, and two coats of varnish complete the work on the outside; the inside being, in most cases, fancy wood, is varnished with three coats of light-colored varnish. The pedestals and wheels get two coats of some cheap oil-paint, such as "grafton-paint," although the former are sometimes painted the color of the sunk-bottom.—*Blacksmith and Wheelwright.*

Faulty Work in Car Framing.

In many car shops that are in other respects well-managed, there are some defects in the working details for which there does not seem to be any sufficient reason. Even in shops where a great deal of piece-work is done, it is found that a large amount of hand-work is necessary in putting together the wooden portions of the trucks. Mortises frequently have to be cleaned out in truck bolsters which should have been finished on the machine. Holes are frequently bored through oak timbers, and castings fitted, gains cut and marking out done, which could better be done in the planing-mill. In fact, the planing-mill work would be accurate, and much cheaper than the hand-work of the truck shop. In some shops in the East we have seen one man of a gang kept pretty busy with his bit and brace boring out holes which had been bored of a wrong size in the mill, and putting in new holes. The time wasted probably amounted to about half a day in each gang. In one instance when a master car-builder was spoken to in regard to this, the reply was: "This work ought to be done on the machine," but further explanation was not given. Similar answers have been made

by other builders elsewhere, and carelessness is probably the only rational explanation that could be given.

In regard to sills, it is an almost universal practice to put too many mortises into them, and this work is in nine cases out of ten done on the floor instead of at the mortising machine. The value of the mortise is small and the injury which it does to the stock is very great. The cross-framing on some roads is spaced very close, and each piece has two tenons going into the sills. The posts are supposed to have one tenon each, and as there is often a post in the middle of the window and one on each side, the number of mortises in the sills materially reduces its strength. With a pair of mortise holes in the sides of the sills, and the line of holes in the top spaced on the average not more than 18 inches, the thickness of the sill is reduced by at least an inch on the top and the side, the remainder being merely so much furring. Truss-planks 3½ inches thick are put in and notched on top an inch deep for every bolt sunk on the sides to let the nuts in flush, and gained on to each post to the extent of ½ or perhaps ⅝ of an inch, the planks become nothing but weak and very heavy strips. Such a use of timber is a discredit to the mechanic and it is to the use of timber in such ways as this that we can trace the excessive weight of some of our American cars. Thinner pieces will give greater strength and security if the wood is not needlessly cut up.

Pieces of timber are used in the floors of cars which give no longitudinal strength, which add nothing to the weight-carrying capacity of the car, and which are introduced merely for the purpose of preventing the cross-tie rods from buckling upon the sills. As there is no strain whatever to break the car open, the cross-tie rods are of little use, and as the heaviest collision throws a merely nominal stress along the center line of the car, small rods would answer equally as well as large ones, and there would be a corresponding reduction in the number of pieces required for the cross-framing. The trouble with a great deal of the bad workmanship, bad framing and the neglect to use machines, seems to be that men have not the time to think, or will not take the trouble to do so. To have everything so systematized that the planing mill can finish the wood work for truck or car frames requires a great deal of foresight.

Lubricating Oils and Car Wheels.

A correspondent of the *Railroad Gazette*, writing from Altoona, Pa., says:

The machine for testing lubricating oils is of ingenious construction. A journal is made to revolve in a bearing at the same rate as when a car wheel moves—15, 30 and 60 miles an hour. The amount of heat produced by the friction is accurately shown by a thermometer while a pendulum moving upon a graduated arc shows the amount of friction or resistance, the wearing quality of the lubricant being determined by the length of time it will stand the test. About one pound of phosphor bronze bearings is worn away under a car for every 25,000 miles run (or two ounces for each bearing,) the journals being supplied with the standard lubricant. The testing of the oils alone has resulted to the great pecuniary advantage of the company; and the honest manufacturer has shared the benefit with the company, since he is now able to sell good material to a better pecuniary advantage than when brought into competition with adulterated goods. Some idea of the accuracy of the tests may be gathered from the fact that, a non-believer in the system who was requested to adulterate some materials and make a memorandum of the proportions used was afterward handed a test report which coincided almost identically with his figures. He immediately became a convert to the system.

For some years the Pennsylvania Railroad Co. experimented with a view to determine the proper chemical formula for the iron for cast-iron car wheels. Old car wheels, new iron and old steel rails are melted together in certain proportions with very beneficial results. This is poured into a mold, so that the tread and not the flange comes into contact with the iron chill. These wheels are afterward annealed and allowed to cool gradually, three days being thus consumed. The superiority of those wheels was shown at a recent test, when 87 well-delivered blows were directed on the same spot on the side of the wheel, with sledges weighing about 20 lbs., before the iron yielded, chilled iron in the tread not even being cracked. Of 80,000 wheels made in 1883 only two wheels were broken in service. Revolving emery wheels are used to take out the "flats" in the tread of car wheels, the periphery of both wheels being similarly reduced at the same time without taking them off the axle. A portable drill for boring, reaming and countersinking the bolt holes in the pedestal jaws of a locomotive frame shows great ingenuity on the part of the inventor. Molding machines are used in the casting of car axle boxes and brake shoes, and save much labor, and add to the capacity of the works.

MR. T. E. HARRISON, Chief Engineer of the Northeastern Railway (Eng.), has made a statement of the results of his professional experience in regard to the working of the Westinghouse brake on that road, showing great economy in maintenance, that there does not appear to be any one point in the principle and arrangement of the brake as now in use that requires alteration, and that in its operation it complies with all the requirements of the Board of Trade. The statement concludes by giving a table of the number of Westinghouse automatic brakes in use and actually ordered up to April 30, 1884, all over the world, and amounting to 11,553 sets for engines, and 63,065 for carriages and wagons (passenger and freight cars). It is further shown that an increase of 8,376 sets for engines and 49,563 for carriages and wagons has taken place in 3 years and 9 months.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay, except in the advertising columns. The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of each month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*

A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*

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ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

RAILWAY DINING CARS.

The extent to which these cars are already in use at the West, and their gradual introduction of late upon several Eastern roads, is beginning to raise the question whether this innovation upon former usage is likely to supersede to any considerable extent the ordinary station restaurants. A good deal of argument more or less weighty has been advanced on both sides, but the preponderance one way or the other can hardly be so decided as to arrest the increasing popularity of dining cars, or do away with the prevailing practice of eating at stations.

According to the current issue of Poor's Manual, 312,000,000 passengers were carried on the railways of this country in 1883, which was an increase of 23,000,000 over the number carried in 1882. A very large proportion of this aggregate, of course, made short trips or carried their dinners with them, but the number who did their eating at station lunch-counters and tables must have run away up into the millions, all of which indicates pretty clearly that the business of feeding railway travelers is as yet comparatively "in its infancy," as the phrase goes. These millions are made up of all sorts of people, the most of whom can discriminate between good and poor fare, and it may be assumed that the most of them are also willing to pay 75 cents for a square meal if it is passably good, or a little better than they are accustomed to get at home. There is also a pretty large and increasing number who are willing to pay a dollar, and even more, for a so-called first-class hotel breakfast, dinner or supper, served in a dining car. Now, as the railway companies are the servants of the great heterogeneous public, provision must be made for feeding people, as far as possible, according to their ability to pay. To subject all indiscriminately to a fixed regulation price for a single meal, whether it be a light or a heavy one, would be unfair, and to serve "refreshments" in the cheap-restaurant, lunch-counter style, would not comport with the luxurious appointments of a dining car as such cars are now gotten up.

It would seem that as a matter of necessity the station eating-places will have to be maintained for a good while yet, and that trains must continue to stop long enough for passengers to eat as they now do—not in a languid, leisurely way, but in a hurry. There is also an equal necessity for dining-cars. The demand for them, as indicated by the growth of passenger traffic as shown in the figures we have quoted, is constantly increasing, and they will soon become as indispensable in all through trains as smoking and baggage cars. The running of them may not yield a satisfactory return to the companies in every case, but once introduced, they will have to be kept up or a loud clamor will be raised by the very large class of travelers who appreciate their convenience. Their popularity thus far is obviously not due altogether to the time saved in making stops. Practically, this is a trifling matter, except as it concerns fast mail and express trains, and even these trains, whether they scoop water or feed their passengers on board, to save time, must stop every few hours to try wheels and examine journals as a matter of safety.

The successful running of dining cars will depend in future, not so much on the attractiveness of their finish and interior arrangement, costly table ware and elaborate bills of fare, as upon the quality of the cookery. If the standard is high at the start, it must be kept so, or their reputation will suffer. All hotel and eating-house experience attests that this is a difficult thing to do, especially when the patronage is large and continuous and there is no very serious competition. Deterioration can only be prevented by the most intelligent and watchful supervision. Care must also be taken to avoid the mistake of trying to serve up too many dishes at once. The fare should be select rather than extensive in its variety with the view of catering to everybody's tastes. This will insure better cooking and better service, and the public will very soon learn to distinguish between quality and variety by giving their preference to the former. It is easy to dilate upon the uninviting array of stale and badly cooked eatables spread out upon the average station lunch-counters, awaiting the onset of the next train-load of hungry passengers eager to make the most of the ten or twenty minutes allowed for "refreshments." To divert people from this mode of satisfying the cravings of appetite, the dining car system must offer something better and not very much dearer in price, with facilities in the way of sitting and standing room that will give no occasion for crowding, rudeness or ill nature. If a lunch service could be provided on these cars for the convenience of such as do not wish or care to pay for a full meal, passengers could then get on the train all that they now get at the dining stations, except the relief of getting out and walking about a little after sitting a long time in crowded cars. So far as the printed bills of fare of some of the Western dining cars may be taken as a criterion of variety, the "spread" is all that the daintiest epicure can reasonably desire, and if the good things are well served and not all cooked in one pot, these cars are in a fair way to fulfill their mission as a blessing to traveling humanity.

The new dining cars turned out during the current year are of course a great improvement every way upon those that were first built, and there is also a corresponding improvement in their management, which is rendering them more acceptable to the class of people for whose convenience they were originally designed. There can be no doubt that they have come to stay, as much so as did the sleeping cars fifteen years ago.

GREEN AND SEASONED CAR TIMBER.

In the building of freight cars, one of the worst things car-builders have to contend against is the difficulty of getting dry lumber of the proper dimensions for the various parts. There are few railway companies, whose roads do not run through coal regions, that are willing to carry a stock of lumber sufficiently large to admit of its being properly seasoned before being used. Many roads that build cars in comparatively small lots, get their lumber in the open market and do not attempt to season it. The results of using green or half-seasoned lumber are strikingly visible in repair yards, where old cars show the extent of the shrinking of the timber with which they were constructed. In contract work, poorly seasoned stuff is the rule and well seasoned the exception, and the same is true to a certain extent of the road shops; but it is not the shops, as such, but those who run them, who are at fault. Many a so-called contract shop has sent out cars with oak sills almost fresh enough from the stump to sprout if it had not been for a coat of paint, when

well-seasoned oak that had been cut three or four years was lying in the lumber yard and could have been used without any increase of cost.

In such cases it may be said that the dimensions of the timber may have had something to do with it. Seasoned oak for freight car bolsters has been rejected at contract shops, in one instance at least, because the size was ¼ of an inch smaller than what was required by the specifications, and green timber used in its stead. In road shops also, when dry stuff on hand varies a trifle from the required dimensions, it is not used because the size does not conform to "our standard." Now, it seems to us that the exact dimensions of car timber are not of such vital importance as some builders are inclined to believe. The variation of ¼ an inch in the thickness of a body bolster, or of 1¼ or 2 inches in its width, is not of much account as compared with the difference between dry and green timber as it affects the service and life of a car. A dry end sill, for example, that is an inch smaller than the specification, is vastly to be preferred to a green one of full size. Considering the loosening of bolts, opening of joints and consequent penetration of moisture into the structure, very few car-builders will be likely to question this.

In view of the evils to which I have referred, it is a question whether it is not possible to agree upon and establish certain sizes of merchantable car lumber that would be recognized as standard sizes to be used for sills, posts, bolsters, braces, etc., and accepted in all contracts for construction. The results of such a system would not be very apparent perhaps at the start, nor are the advantages that would accrue so obvious as to make some mention of them out of place. The standard sizes once adopted, lumber manufacturers would feel safe in sawing stock to size and holding it to become seasoned, and the general market would be supplied with a larger quantity of seasoned stock from which the roads could draw for car work and thus be relieved from the necessity of carrying very large stocks themselves. So far as such a system would tend to increase the durability of freight cars and lessen the aggregate of repairs, it would be a boon to the roads, and enable builders to turn out more satisfactory work for the same prices. Most of the car-building establishments would be willing to keep on hand large quantities of dry lumber if they could be sure of working it off without the waste of cutting it to a diversity of sizes for the same parts of a car. Under such an arrangement, it would be possible for a road to get out 500 cars, more or less, at the shortest notice, and built of good material so far as the timber is concerned.

The suggestion of merchantable sizes for car timber may be considered as somewhat visionary by those who are looking for a "standard" freight car, or cars, within the next twelve months. But if such standard or standards shall reach the climax of consummation within the period named, the event, instead of weakening will strengthen the suggestion.

ELECTRIC CAR LIGHTING.

The newspapers are full of tantalizing announcements which seemingly point to an early and successful solution of the problem of lighting railway cars by electricity. Experiments are being made with dynamos and storage batteries, capital organized, and companies formed for the purchase and control of patents so that railway companies can make use of some one or more of the competing systems without the risk of being sued for infringements. In view of the reported success with which electric car lighting has been attended upon some of the English roads, and the progress that has been made in this country in the lighting of streets, parks, manufacturing establishments and public and private buildings, it would seem that the superior benefits of this kind of illumination could not much longer be withheld from the great mass of people who travel in our passenger trains. There are difficulties, however, more or less formidable, that have yet to be overcome before the desired consummation is likely to be reached, the nature of which is not very clearly stated in the glowing accounts of successful experiments that are so frequently met with in the newspapers.

These difficulties pertain to the uniform, continuous and economical generation of the electric supply for each car of a train when moving and while making stops, the conditions to be provided for being very different from those of a stationary structure. The variableness of the speed between stops is the great obstacle in the way of utilizing the electric system for passenger cars, and another and perhaps less serious obstacle is the tax upon the power of the engine in running a dynamo of sufficient capacity for the whole train. A special engine or a pulley on the car axles are the remaining alternatives, both of which are objectionable, and for obvious reasons. A special engine and boiler would be too expensive and occupy too much room, and the speed of the axle-pulleys would be too variable, to say nothing of the frequent stops a train must make in ordinary running. A stored supply of electricity would have to be drawn upon from accumulators during such stops or the lights would go out. The wonderful invention of the storage battery, doing away with the great advantage which gas was supposed to have in this respect, would seem to be a complete remedy for the drawbacks of the pulley and axle arrangement, were it not for the fact that these batteries, so far as their capacities have been developed, are short-lived and have to be frequently renewed. Some means, it is to be hoped, will be discovered by which they can be made more lasting and thus avoid an expense which must weigh heavily against their use in the lighting of cars.

The handsome but cumbersome car lamps now so extensively used, are, as a rule, quite as much admired for their ornamental features as for their illuminating properties. However skillfully designed, they are none the less oil receptacles and necessarily cast a shadow where no shadow is wanted. Gas made from various products affords a very satisfactory light when used in sufficient quantity, and it must be said that a great many cars are very well lighted, so well, indeed, that good eyes can see to read display advertisements or double-leaded electioneering editorials without much difficulty; but a certain limit of cost must not be exceeded, and therefore any such excess is not expected. But it is only a certain proportion of the whole number of cars running that are lighted in this way. The residue are lighted poorly enough. Suppose the artificial light, good, bad and indifferent, in all the cars in the country could be reduced to a mathematical quantity at a certain hour of a winter evening, and the exact average per car ascertained, the result would be such a sickly glimmer in comparison with what it should be, that to call it "illumination" would be a severe reflection upon the tallow candles of forty years ago.

Electricity, if it comes into use for the lighting of cars, must give as good a light as the best we now get, or we don't want it. If it is to be dispensed in a niggardly, parsimonious way, the mere fact that it is "electric" will not satisfy the demand for better light, a kind of light that will enable people whose eyes are in normally good condition, to read ordinary print in any part of a car.

LOSS OF MACHINE PATTERNS BY FIRE.

A dozen years ago, such a fire as that which occurred recently at the Baldwin Locomotive Works would have been looked upon as a calamity for which insurance was the only compensation. Insurance, however, although it may be heavy, does not by any means make good the loss of patterns and tools in such cases. Patterns, especially, have a value beyond any mere money equivalent. Very frequently it is impossible to replace them. Changes are often made, which, in their final form have their only record in the patterns themselves, and the loss of patterns in locomotive shops may necessitate the condemnation of an engine or class of engines as being cheaper than to make the patterns over again. Even if the full cost of making them can be recovered from insurance, no railway company or other establishment is ever able to put a sufficient force of men at work at once to replace what has been destroyed. For the loss of machinery and tools, the Baldwin Works will doubtless find a fair compensation in the insurance, but not so in respect to patterns, drawings and gauges. Some of these may be missing when most wanted, and the delay and inconvenience resulting will not be a mere temporary drawback, but will be felt perhaps for years.

The present systems of insurance have been perfected to such a degree as to very greatly diminish the risk of such losses. The great mutual companies, by devising automatic alarms and apparatus by which water can be directed upon fires in their incipient stages by utilizing the heat for that purpose, have done much to prevent losses both to the insurers and the insured. The amount saved in large establishments by putting in automatic sprinklers and a system of water pipes with a certainty of action in emergencies that can be relied upon, has been so great in many cases as to pay the cost of the plant in a single year. On the score of general economy, then, and especially to prevent the loss of patterns and other property, the value of which can not be estimated in dollars and cents, it will pay to introduce the more complete systems of protection against fire, and substitute them to a certain extent for the ordinary extra hazardous rates of insurance.

THE INTERESTS OF CAPITAL AND LABOR.

An exchange says that it is generally becoming recognized that the interests of capital and labor are identical, and that one can not suffer without the other. This apparent truism, repeated so often that it has long since become threadbare, is one of the many specious phrases that obtain currency and acceptance merely because they are vague, plausible and to a great extent meaningless. The owners of capital desire the largest return for its use, and those to whom it gives employment desire the highest wages their labor will command, and in these respects the interests of the two classes are identical. Both want to make money. The interests of lenders and borrowers, sellers and buyers bulls and bears, are identical in the same sense. But this identity with respect to the end to be attained does not destroy or neutralize the inherent antagonism which necessarily exists between opposites, and capital and labor, like hills and valleys, are none the less opposites for being counterparts. Capital can not be increased without labor, and labor is largely dependent upon capital for something to do. There is, however, but little congeniality between them, but on the contrary, distrust, suspicion and jealousy. The intrinsic antagonism, aside from the common desire for gain which actuates both, is the source of the trouble which is sure to arise when the normal relations of the two are disturbed by extraneous causes. The two interests are, in fact, not really identical. There is always a line of separation. It may be difficult sometimes to determine exactly where it runs, but it is there, and can no more be obliterated than the distinction between rich and poor, creditor and debtor, or employer and employé. The employer's profits are not increased by raising the wages of those in his employ, nor can those in his employ grow rich merely because the business happens to be a lucrative one to the employer. One relies upon good management, lucky ventures and the fluctuation of markets; the other upon stipulated wages. Their respective interests can not be amalgamated, although they are the same in kind or as respects the end sought, and the oft-repeated assertion that they are identical is deceptive and misleading, and has but little influence in reconciling the conflicting elements involved in the relations of the two factors.

RIGID AND SWING-BEAM TRUCKS.

The question whether rigid or swing-beam trucks are the best for passenger cars is receiving a good deal of attention just now among car-builders, and although a very large majority of them doubtless feel convinced beyond any misgiving that swing-motion trucks are productive of the best results, there are, nevertheless, many things to be said on the other side of the question which seem to prove very clearly that the rigid style of truck has a decided superiority over certain kinds of swing-motion that are now quite extensively used.

One of the prominent reasons urged in behalf of rigid trucks is, that the time when a swing-beam was of any special value has passed, and that the condition of the road-beds has been so much improved that a swing-motion is not so much needed as it once was to lessen the shocks upon the wheels. It is also said that the elevation of the outer rail on curves, and the smoothness of the tracks on tangents, render a side motion unnecessary under these improved conditions. The gradual shortening of suspension links is also urged as another reason for dispensing with the swing motion. These links, from their reduced length, are rigid and can yield but little under the heaviest blows, since their resistance increases very rapidly as they leave their normal positions. Many builders still further increase this resistance by placing the links at an angle.

Some years ago, Mr. John Mackenzie, the Superintendent of Machinery of the New York, Chicago & St. Louis road, made a series of experiments with passenger coaches by placing them alternately on rigid and swing motion trucks and testing them under a variety of conditions, the result of which seemed to justify the conclusion that the cars rode best on the rigid trucks. To verify the correctness of this conclusion, he made a few calculations as to the force necessary to move a truck having 8-inch links, sideways under a car weighing, say 48,000 pounds. We have not the figures to show how the result was reached, but the force was shown to be so great that it made little difference whether the car was moved bodily, or whether the truck moved beneath it, allowing the body to follow. With the short links, the time of vibration is reduced so much as to make the body follow the motion of the wheels with very nearly the same speed as in a rigid truck.

Mr. C. A. Smith, when Master Car-Builder of the Erie road, a dozen years ago or more, used to put a spring at each end of the swing-beam, and allow only so much motion as could be obtained from the compression of these springs. The motion of the truck was in this way transmitted to the car body, the springs serving merely as cushions for the blow. Probably this is as much motion as is ever obtained from the ordinary short links. It was a very small quantity, but as we remember the riding of the Erie cars at that time, it was ample even on that very crooked road. The springs were put in under compression, and truck and car body, as far as time was concerned, practically moved together. With long hangers, such an arrangement was probably much better than the short stiff hanger now in use. The cushion was obtained, and there was no possibility of a swing or roll.

The long, soft or easy swing that was considered so essential in former days, is manifestly out of place on cars now, the bodies of which are more than twice as heavy as those for which the motion was originally designed. But instead of abandoning the swing-motion altogether, would it not be better to have one designed with a special adaptation to the more perfect tracks and heavier cars of the present time? The side shocks which trucks receive are, it is true, less in extent than they formerly were, but they are more numerous, and, from the weight of the cars, much more severe. The lateral play of the journals in the brasses is hardly sufficient to relieve the flanges of the wheels, although many builders hold the contrary opinion, and also take the ground that the side motion in future will be such that the body of the car will be moved slowly, or rather will follow slowly the quick motion of the truck, and that it will be such as to permit the truck to oscillate as rapidly as may be necessary under the car. Such a motion, however, must have the apparently paradoxical feature of not permitting the car body to swing. To

design a motion that shall be at once easy and rapid, and without a dangerous and disagreeable swing, is extremely difficult, and whether it is possible with any form of link is somewhat doubtful. If a rigid truck could be arranged with springs so as to cushion the side motion of the axles, the result would be a very great simplification in the construction of passenger trucks, and the reduction of weight would be considerable. A long, easy side motion without a tendency to roll or swing, is quite possible, as is evident from the action of the old side-spring buggy as compared with that of the same vehicle with long elliptics. Dropping into a hole or going over a stone would cause much vibration in the latter case, but in the former the vehicle would make one plunge and then the motion would cease. So a side motion might be designed which in any given swing would exhaust the whole force of such motion of a truck, and at the same time cushion the blow. Until this can be done, those who hold that the swing-motion is useless will have rather the best of the argument with those who are using it in its more stiff and rigid forms.

BRAKE APPLIANCES IN ENGLAND.

A number of railway accidents have occurred upon English roads within the last few months and have been made the subject of numerous articles in the London journals, in which brakes, cars and railway management generally have been freely discussed. To an American who is at all familiar with the safety appliances, and especially the system of brakes in use on our own roads, it is somewhat amazing that such a state of uncertainty should prevail among English railway men in reference to the best brake apparatus for passenger trains, and the proper method of applying it. It appears from the discussions referred to, that the managers of more than one English road have gravely reached the conclusion that hand-brakes are, after all, the best device for stopping trains in ordinary running, and that power-brakes should be in the exclusive control of the engineers or drivers, and be used only in emergencies or on extraordinary occasions. On some roads no definite conclusions seem to have been reached, and sundry devices are being tried under various conditions of working, while other roads still appear to be in doubt as to whether any power-brakes at all are necessary. There seems to be, in fact, a mechanical obtuseness in regard to this class of life-saving appliances which is inexplicable in view of the maxim, "strength and safety at any cost," so often quoted as illustrative of English railway practice.

Another curious sequel to the accidents referred to, is the discussion on this side the water of the relative advantages of English and American passenger cars, or the compartment side-door system of the one and the general seating saloon with end doors of the other. So long as it is possible for trains to leave the rails, drag cars over the ties or roll them down embankments, so long will compartment vehicles be at a disadvantage. The longer time required to get out of the long cars in such case is no argument in favor of the weaker, more dangerous, though possibly more convenient style. There are on many of our local, suburban steam lines a great number of so-called "excursion cars" running with their sides entirely open and every seat crowded with passengers, which is all very fine so long as the cars keep on the track. If they should leave the track and roll over, as cars sometimes do, it would not be quite so fine. In railroading, whatever safety requires should be paramount, and hence the prediction may be hazarded that the long American coaches with automatic air-brakes will maintain their supremacy until the fertility of inventors shall devise something better.

END VENTILATORS.

On many of the Western roads the end ventilators of cars are either closed up or omitted entirely. One car-builder of good judgment and long experience is building all his passenger cars with solid ends, and these are some of the reasons which he gives for doing it:

"The end ventilator in the roof, when open, takes all the coal cinders and smoke from the engine. If a screen is put in fine enough to keep out dust, the air is as effectually kept out as though the ventilator were closed. The rush of smoke and cinders along the roof fills the head-lining with dirt and grime, making them short-lived and difficult to clean. The dirt is equally bad for the brass work, and at forty miles an hour the dust will drive in at a rate sufficient almost to choke a person. In winter these ventilators are useless, since if left open they are equivalent to an open door. In summer the ventilators in the raised roof will do the work, and in the winter they are more than ample for the purpose. The end ventilation in the winter is altogether too direct, since it sends a gale directly in the faces of the passengers. The screens on the sides of the raised roof are very effective, much more so than those in the end of the car, which are practically at right angles to the upward draught under the hood. On the sides of the raised deck the cinders from the engines pass parallel to the screens."

Some of these reasons are of general application, while others are of special force in the West, where soft coal is used, and where the annoyance from coal smoke is much greater than in those portions of the country where anthracite is burned. But whether in the West or East, the end ventilator is too powerful in winter to be used with safety to the passengers. Many car-builders have been misled in regard to the quantity of air needed for perfect ventilation, by the wild statements of enthusiastic cranks who have experimented in warm weather, and who have never learned that the quantity of air fouled by a human being will vary with the season of the year and with the temperature. In summer the back part of a platform car, if fitted with passenger car seats, would not, at a speed of 20 miles an hour, be well ventilated if there was no side wind and the seats were all full, while in the winter an opening of 6 inches by 12 would give an abundant air supply to a whole car full of people. It is safe to say that the end ventilator in cold climates and in winter, is rather more of a good thing than is required for health or safety. It should, furthermore, be remembered that the dangers from cold draughts are vastly greater, and the consequences more serious, than those which arise from a somewhat insufficient ventilation. A person may remain for half an hour in a room where there is an impure atmosphere without any serious harm, but few people can sit in a draught of cold air for the same length of time without taking cold. Excessive ventilation is a thing that should be guarded against quite as much as too little.

FREIGHT CAR BODY FRAMING.

The end braces of a freight car body should be so disposed as to hold up the center sills with the aid of the trusses. The side truss, if no truss rods are used, holds up the corner, with the bolster as a point of support or fulcrum. If truss-rods are used, the corner aids the side truss in doing this. Consequently the braces should run from the corner up to the center of the end of the car. When placed in the opposite way they load the center sills, and the moment these sag a little, the brace becomes worse than useless, since it is loose in its place and is merely an additional load upon the already too heavily loaded center sills.

Our attention was recently called to this faulty method of bracing, by Mr. Milton Wilder, of the New York, Lake Erie & Western road, who said that the result of it was a considerable amount of repairing. The reason this feature of construction is adhered to by so many car-builders, is probably because they lose sight of the fact that the bolsters are the foundation of the car and support the whole load. The strength of the sill unaided by truss-rods or truss is for this purpose very slight, and even if it was sufficient, the sill would soon sag sufficiently to allow a brace to become loose and thus render it useless. A brace-rod run in the contrary direction to a brace, is by no means as good construction as a brace. The general trouble is that brace-rods under strain pull the washers into the wood. This causes the frame to sag, and so also does the stretching of the rods, which is often sufficient to allow the frame to drop out of line. Whether this would be the case if the washers were made five or six inches long by the full width of the plate, is a matter of conjecture so far as we are aware. One large brace extending from the bolster to the corner of the car, gives a perfect corner support if the pockets are made large enough to prevent the crushing of the wood, and also holds the frame so rigidly that it is not liable to be racked by the momentum of the load, or the superstructure to part company with the floor.

As bearing upon the principle of construction, Mr. F. M. Wilder said in a discussion at the recent Saratoga convention, that body-bolsters should be made wider than they usually are, or, when made of iron, they should be double. The bearing they take upon the sill is not sufficient to give the proper amount of support, nor to prevent the wood from being crushed by the load.

Narrow bolsters in heavy service have a tendency to turn over and thus cripple the frame. Mr. Kirby proposed that the bolsters should be divided in order to give the end of the car more support under the weight of the draw timbers and draw gear. Under the strain of buffing below the line of the sills, the tendency to break down the end of the car becomes very great.

WELDING STEEL AND IRON SCRAP.

The advent of machinery steel is generally regarded by the engineering profession as a new departure in the sphere of mechanics that is to be attended with the most advantageous results. However this may be as to particular lines of construction, it will be well for car-builders and master mechanics to inquire whether its use in the construction of railway rolling stock is not likely to be attended with some serious disadvantages. It is obvious that if steel is to be largely used in the building of cars and engines, and for the various purposes of equipment and maintenance, it will find its way into miscellaneous scrap, and when once there it will be found extremely difficult to separate it perfectly from the iron, as the two metals are not easily distinguishable after the pieces have become rusty or dirty from exposure.

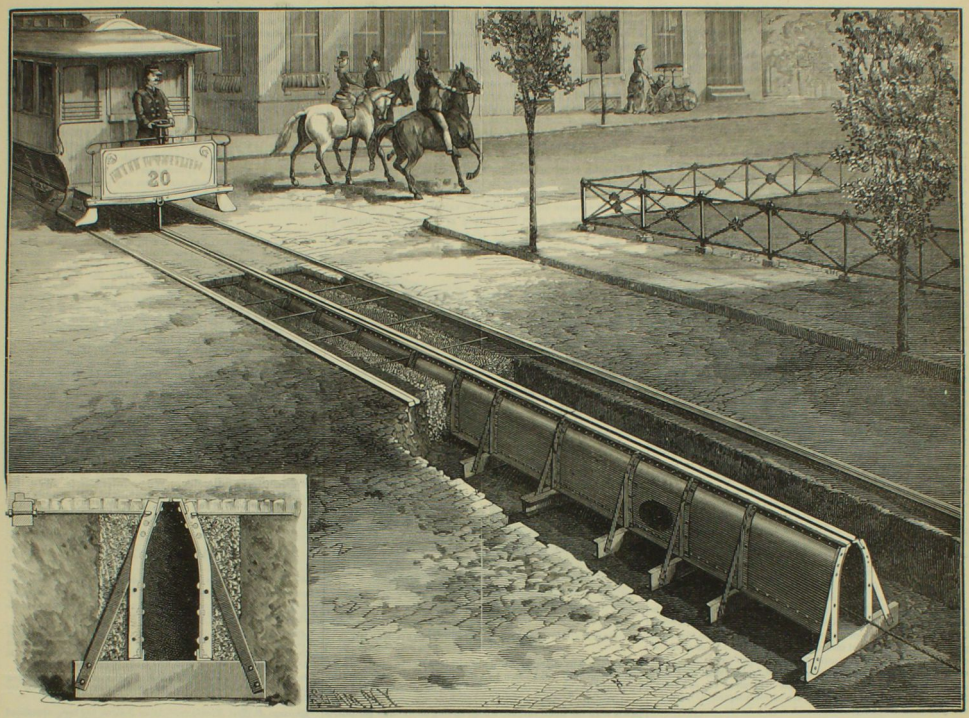
Inasmuch as large quantities of axles, frames, equalizers and other important parts of cars and locomotives are made in railway shops from scrap to a greater or less extent, it becomes a question of some importance whether the presence of steel in the scrap will not cause difficulty in working, and whether forgings made from the mixed metal are as strong and as serviceable as they would be if made of iron alone. In anticipation of trouble from this source, Mr. Verbryck, the Master Car-Builder of the Chicago, Rock Island & Pacific road, has recently made some experiments to determine how steel will weld with iron in ordinary working. The first of these experiments was made with machinery steel alone. A bar of it was cut up into pieces, laid in a pile and welded under the hammer. The result was a fair bar some three inches in diameter, which, when broken, showed a good fracture, and was in fact a satisfactory piece of metal that would give no trouble to the blacksmith. The next experiment was made by introducing a few pieces of steel into a pile made up of ordinary clean scrap iron. Several bars of the same size as above were made, which showed a good and handsome surface, but upon being broken the fractures showed that the metal was unsound and not homogeneous. The steel and iron had not welded, and the bars were so defective as to be practically useless. In some of the bars the flaws were in the form of wide cracks, while in others there were seams which completely separated the two metals. True welding had nowhere taken place. The result showed that steel, once in the scrap pile with iron, is a very unmanageable factor in the making of sound forgings, and that the use of mixed scrap for the purposes named is out of the question.

After considering the possibility of sorting the scrap so as to get the steel out of it, Mr. Verbryck came to the conclusion that it could not be done on his road, although the scrap yard of his shops is systematically arranged, from the fact that the scrap comes to it from the entire line, except from the locomotive department, and the sorting is carried to such an extent that nuts, washers, heavy bar iron, as well as plate and long rods, are kept separate.

It would appear from this, that unless extraordinary care is taken in sorting the scrap from which axles, coupling-rods and equalizers are made, serious accidents will be liable to occur from breakages caused by hidden flaws, and the question becomes a grave one whether steel and iron in combination can be safely used to any considerable extent in car and locomotive work.

THE ferry-houses of the Pennsylvania Railroad, at Jersey City, which were burned about a month ago, proved an easy prey to the flames in consequence of the combustible nature of the materials, the light construction and the extended passage-ways forming channels for air currents to fan the fire as soon as it was fairly under way. The foundation, consisting of timber-piles driven deep into the river bed, the tops of the piles were burned off, more or less, and rendered useless as a foundation for the new structure. There seems to be no help for this tinder-box construction along the water-fronts of New York and the adjacent cities on each side, unless light iron instead of wooden superstructures can be erected on pile foundations. The objection to iron is that it is liable to corrosion by exposure to a saline atmosphere; yet the South Ferry and the Fulton Ferry houses on the New York side are of iron, and were built some twenty years ago, and are still not only fire-proof but in apparently good condition. Brick or stone for superstructure is, of course, quite out of the question, unless supported by a submarine foundation of piles or granite, and this would involve a heavy expenditure, although it would pay in the long run. The new ferry buildidgs in Jersey City, now in process of erection on the site of the old ones that disappeared so quickly a few weeks ago, are just as tinder-like and combustible as the former buildings were, and just as likely to take fire and be consumed from a gas explosion or an accidental spark.

A NUMBER of representative railroad men recently met in the yards of the Pennsylvania Railroad Co., at Altoona, where a train of eight passenger cars was in position, each one having a different kind of light. The first car was illuminated by ordinary coal gas, the second by the same quality of gas with gasoline added to enrich the flame; in the third car the Lipsey burner, using the same enriched gas as the second car was used. The globe of this burner throws the light down as well as a very considerable amount of heat, and looked like a Siemen's burner upside down. The illumination, however, was very good. In the fourth car the Siemen's burner was tried, supplied with the same kind of gas but, owing to the location of the burners on the lamps, it threw a very distinct shadow on the floor of the car, and on the seats. The fifth car was lighted with the oil gas system used by the Philadelphia & Reading road for several years. The light was about the same as the ordinary gas light. The next car had the Pintsch gas light, each globe had four burners, and the steadiness of the flame was remarkable. The light was very good. The seventh car had a gas made from gasoline, using an Argand burner which made a beautiful light, and which is promised to be perfect on the application of several new principles by its owners. The last car was beautifully illuminated by the Brush electric light from a storage battery. The simplicity of the whole lighting apparatus, together with the excellence of the light, made the electric display the best of all.



A NEW SYSTEM OF WROUGHT-IRON TUBE FOR CABLE RAILWAYS.

The engraving illustrates a new system of tube for cable railways.

This tube is made up sections bolted together, each section being a self-contained girder, the upper chord of which has a continuous slot, admitting the grip bar to the interior of the cable tube. Each section consists of two opposite side plates the upper portions of which are bent so as to converge toward each other. To their upper edges are riveted angle bars of proper shape, far enough apart to form the continuous slot above referred to. The lower edges of these side plates are connected with angle bars to a bottom plate. The side plates, and preferably also the bottom plate, and the top and bottom angles, extend throughout the entire length of the section, thus forming a self-contained girder, of which the upper angles form the top chord, the side plates, the webs, and the lower angles and bottom plate the bottom chord.

To provide against lateral pressure on the sides of the tube from the pavement and from vehicles crossing over the top chord angles, a series of braced frames are riveted to the sides and bottom of the tube, consisting of angle ribs, lower transverse channel beams or heavy angles, and inclined brace bars, riveted to the upper end of the angle ribs, and to the ends of the lower transverse channel beams or angles.

The body of the girder or tube is about 33 in. deep; the transverse channel beams are 8 in. deep. The clear width of the tube in its lower portion is 12 in., and the length of the transverse channel beams is 40 in., being the widest part of the tube at any point. The sections are made in convenient lengths of about 16 ft., the connection between two consecutive sections being made by bolts through angle ribs at their ends. Thus a continuous tube or conduit is formed, complete in itself.

The work of laying the tubes is extremely simple. A trench is dug 3 feet deep from the surface and 3 feet 8 in. wide, for a distance of a block at a time, into which are lowered the tubes, and, after having been properly leveled up and bolted together and connected to the track stringers by three-quarter-inch round rods attached to the angle ribs on the tubes, the work of closing up the ditch begins. First the space under and alongside of the tube is filled with concrete to within a foot of the surface of the street, sand to the depth of several inches is then thrown on, and the whole paved over with Belgian blocks.

Every alternate tube is provided with a manhole in one of the web plates, affording access to the tube for the purpose of introducing or removing the cable, oiling the sheaves, etc. At each of these manholes a chamber is made in the concrete, accessible from the street through a square opening alongside the track, which is covered with a cast-iron lid.

It will be seen that the whole process of laying these tubes is so very simple, that the advantages of this system of tubes are quite apparent. The limited width of the trench, which leaves the tracks wholly intact, enables the construction of the cable railway to proceed without interfering with the running of the horse cars, requiring any temporary side tracks or movable bridges, where existing lines of horse railway are changed into cable railway. In this connection Mr. George Rice, Chief Engineer of the Cable Division of the Union Passenger Railway Company, of Philadelphia, which company is now completing the laying of 20 miles of this tube, writes in response to an inquiry:

"I have made a careful examination of the different cable roads in California and Chicago, and I believe our Philadelphia system of cable tubes is the best for several reasons. It is simple in its construction, and consequently cheaper than any of the existing systems of tubes that have any claim to permanency. These tubes can be laid more rapidly, and for construction on an existing line of horse railway, without interference with the traffic, this system has no rival.

"It would be impossible to build a cable line, such as is in use in Chicago or on Market street, San Francisco, without side tracks or some device, such as a movable bridge, on which to pass the cars over the break in the street. In a narrow street the side tracks are not admissable, and the bridge device would be a cumbersome and expensive means of keeping the cars in motion over the work," etc.

Any further information in regard to the tube, relating to the construction, cost, etc., can be obtained on application to the inventor, A. Bonzano, Chief Engineer of the Phœnix Bridge Company, at Phœnixville, Pa. This system of tubes is patented in the United States and Great Britain. —*Scientific American.*

ABOUT 94 per cent. of the double mileage of the railways in England and Wales is now worked on the absolute block system, and the greater portion of the single lines is under the same control in addition to the train-staff system. In Scotland the double mileage worked by the absolute block is 90 per cent. of the whole, and in Ireland 22 per cent.

Effect of Case-Hardening on Iron.

Among some master mechanics and locomotive builders there exists a strong prejudice in favor of using case-hardened pins, yet pins of this kind fail oftener than any other part of a first-class locomotive. Some time ago the Baldwin people becoming convinced that case-hardened pins were unreliable, they determined to make some systematic tests to prove the matter beyond peradventure. They took a bar of 2-in. iron and cut it into lengths of 12 in. One piece they kept out and the others they put in the case-hardening furnace. After being an hour in the furnace one piece was taken out, and another after it had been two hours in, and so on till the five pieces and gone through the case-hardening operation, the last piece taken out having been in five hours. All the pieces were then in succession subjected to a breaking strain, when it was found they had decreased in strength in proportion to the time they had been in the furnace. Examination showed that the case-hardening process did not merely affect the outside of the iron, it went to the center. In the piece that had been in longest, the heart had become crystalline and very coarse. All the others showed similar indications in smaller degrees according to the time they had been in the furnace. In the breaking tests, the piece that had not been in the furnace doubled without breaking, but all the others snapped off.—*American Machinist.*

SLATE has been tried upon several Western roads for floors of refrigerator cars, and also for floors of saloons in passenger cars, with very satisfactory results. Mr. Robert Miller, of the Michigan Central, after experimenting with various kinds of metals with no very marked success, concluded to try slate in his passenger car saloons, using a single slab for each saloon, ¾ of an inch thick and laid in a bed of hydraulic cement. The sides of the room are also sheathed with slate for some distance above the floor, so that all the lower portion can be washed and kept clean. Slate, as is well known, is a perfect non-absorbent, waterproof and durable, and is not acted upon by ammonia. It is also used for floors in the Hutchins refrigerator cars on this road, and very successfully. It does not absorb the brine or the drippings from the load, and retains no odor after the floor has been washed. Whether it is liable to breakage from thumping and concussion, such as occurs in ordinary running, is not stated, but the inference is that it is not.

Improvements in Spear's Car Heaters.

The latest styles of Spear's car heaters have some improvements which add materially to the effectiveness and economy of the apparatus. With the general features of these stoves railroad men are quite familiar, and will be able to understand by a brief description, the nature of the improvements referred to. In order to provide for greater certainty in the movement of the air in the heater a change has been made in the arrangement of the hood. Instead of placing a valve at each end, the two valve seats are brought close together and placed so as to form an A when seen endwise. The valve is hung between the seats, and, of course, hangs vertically when the car is not moving, but as soon as it is in motion the air pressure carries the valve against the rear seat and the inflowing current is carried through the heater. This does away with one valve, to that extent simplifying the apparatus. A considerable increase in heating power has also been made by the introduction of vertical diaphragms into the air spaces on each side of the fire-box, which prevents the possibility of getting a direct delivery of cold air through the base of the stove in very cold weather. With a low fire, low temperature and high speed, it was possible heretofore for the air to pass the fire-pot without being sufficiently warmed. The diaphragms cause the cold current to traverse from bottom to top of the heating surface and make perfect heating much more certain. In the improved heaters, also, the smoke pipe is placed at the back of the stove so as to avoid the use of an elbow, and dampers are provided for both the stove and air pipe. If brakemen who are not as a rule very well informed in respect to the nature and regulation of air currents, could be taken into the shop and shown one of these heaters dismounted, and have its operation explained to them, the saving in fuel consumption alone would be very considerable. When passengers feel that there is too much or too little heat, the fault is too often laid to the heater, when the cause is with the brakeman, who is perhaps doing his best to make the car comfortable without knowing the right way to do it. The heater, if properly managed, will secure good ventilation in winter, but attempts are too often made to assist it by making use of the summer ventilator, the result of which is to send a cold draft through the car and chill the passengers. On some roads these heaters have been rigged with an ash-pan opening through the floor to the outside, which relieves the car of a good deal of dust and dirt. The same could be done upon almost any car, unless there is a diagonal corner timber. Deep ash-pans arranged in this way make frequent emptyings unnecessary.

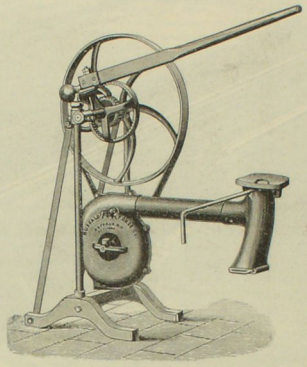
Cottages, or Hints on Economical Building; Illustrated. By A. W. Brunner, Architect, pp. 54. Wm. T. Comstock, Pub. 6 Astor Place, New York. Price, $1.00. The aim of this little book is to assist those who are about to build, or those interested in the building of low-priced cottages. Elevations and plans are given, with much useful information with respect to methods of construction. To railway superintendents who have station and depot buildings to design the book will be found useful and suggestive, especially in the matter of the treatment of exteriors. Several of the designs illustrated are better adapted to railway stations than dwelling houses, and would be an improvement upon the average railway station of the period. The tendency at present is to give to this class of structures some pronounced architectural embellishment, and any practical hints in furtherance of this object are valuable and ought to be appreciated.

THE partnership firm of A. French & Co., of Pittsburgh, manufacturers of elliptic springs, and the French Spiral Spring Co., Limited, of Pittsburgh, have been dissolved by mutual consent, and the business of the two companies will hereafter be carried on by "The A. French Spring Co., Limited." The new company is a limited co-partnership formed under the laws of Pennsylvania, and will continue the manufacture of all kinds of elliptic and spiral railway springs; also wagon and carriage springs, and spiral springs of all kinds for valves, agricultural implements, machinery, etc. The officers of the new concern are: Aaron French, Chairman; John R. French, Vice-Chairman; Geo. W. Morris, General Manager; D. C. Noble, Secretary and Treasurer; W. P. Hansell, General Superintendent. Offices and works, 20th, 21st and Liberty streets, and 25th and Smallman streets, Pittsburgh, Pa.

THE TANITE COMPANY, of Stroudsburg, Pa., manufacturers of solid emery wheels, are now arranging for a large extension of their factory. This factory was started in the year 1867 by the erection of a stone building 45 feet long and 32 feet wide, two story and attic, with boiler shed extension. The total floor room of the original buildings amounted to 5,550 square feet. The flooring used at the present time is 34,190 square feet. The new building will be an extension of, and the same size as the original stone building. It will be a substantial structure of stone, supported by heavy iron arches which are to span the wheel-pit and overflow. In order to extend and more thoroughly control the water-power and to secure timber and stone for further operations, the company have bought a farm of 130 acres which adjourned the property. The total amount of land now connected with the Tanite factory is about 180 acres.

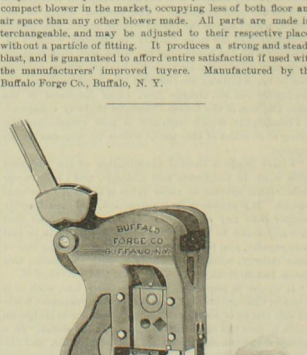
THE 250 horse-power Cummer engine just started in the Amoskeag Cotton Mills, at Manchester, N. H., has attracted a great deal of favorable attention. The following shipments have just been made by the Cummer Co.: One 55 horse-power engine with outfit complete, to the Goshen El. St. Co., Goshen, Ind.; one of 120 horse-power to Louis Mitchell, Warsaw, Wis.; one of 130 horse-power to C. B. & D. H. Gowan, Canal Winchester, O.; one of 55 horse-power with outfit complete, to A. Dietly & Son, Moorheadville, Pa., and one of 250 horse-power to I. P. Evans & Co., Indianapolis, Ind. The Cummer Co. have also just started one of their ice and refrigerator machines in the plant of the R. H. Portner Brewing Co., Alexandria, Va., and another in the brewery of A. Ziegler & Co., Buffalo, N. Y. This is the second Ballentine ice and refrigerator machine furnished that company. The erection of two of the Cummer refrigerator machines has just been completed in the plant of the Co-operative Brewing Co., of Buffalo, and one more machine and four engines are about to be shipped. The company reports a flattering business outlook, and they are running to their full capacity on orders.

THE E. D. ALBRO CO., of Cincinnati, O., manufacturers of veneers and dealers in mahogany and cabinet woods, have issued a revised edition of their wholesale price list. The company's stock of logs and veneers is very extensive and embraces a great variety of the choicest foreign and native woods in request for cabinet and car work, the demand for which has been so great during the past year that the capacity of the company's mills has been increased by the addition of a great deal of new machinery in order to keep up with orders. Special attention is given to the seasoning of lumber in such a way as not to injure it. This is done by drying it at a low temperature, a process which retains the strength and life of the wood. The company import French walnut burls and other foreign woods direct. Mahogany and Spanish cedar are brought from Mexico to New Orleans in their own vessels, and thence to Cincinnati by river transportation. The company's extensive mills on the Tennessee River are located in a region especially rich in valuable timber, and they are the owners of a large quantity of growing walnut timber in Kentucky.



New Buffalo Blacksmith's Hand-Blower, No. 01.

The blower is mounted on an upright iron frame, firmly braced and stiffened, as will be seen by reference to cut. It is operated by means of a lever, with the swivel motion so natural and easy to blacksmiths. A downward pressure of the lever engages the pawls with the small ratchet-wheel, having on its outer periphery a fixed shaft, upon which revolves a small and large pinion or gear, cast together. The small pinion, in being thrown forward is revolved in the opposite direction on its own axis by meshing with the large fixed internal gear, and, in turn, communicates motion to the large band or fly-wheel, which, by belt, transmits speed to the fan. The entire mechanism is operated on one fixed steel shaft, thereby greatly reducing the friction and and wearing of journals, with a combination of strong, heavy toothed gears, arranged in such a form as to render it impossible for any slipping to occur. It affords at all times a positive motion, and is operated with perfect ease. It is represented to be the most compact blower in the market, occupying less of both floor and air space than any other blower made. All parts are made interchangeable, and may be adjusted to their respective places without a particle of fitting. It produces a strong and steady blast, and is guaranteed to afford entire satisfaction if used with the manufacturers' improved tuyere. Manufactured by the Buffalo Forge Co., Buffalo, N. Y.



Buffalo Combined Punch, Shear and Bar Cutter, No. 40.

This machine is an entirely new design, its mechanism and manner of operating being on the inclined and eccentric principle. Its proportions and power applied and obtained, are as 1 to 125, making it the most powerful machine of its size and weight in the market. This power is applied in a rigidly perpendicular direction, with no lateral strain whatever. There are but five pieces of castings in its entire construction, with no set-screws, keys or springs in working parts. This simple and compact form, hardly second to its enormous power, will commend the machine to the practical purchaser at sight. The parts are interchangeable, the motion positive, small space is required, and it is adapted to light or heavy work.

Machine No. 39 will shear ¼-inch strap iron, 2½ inches wide, or 5 inches by reversing: will punch ¼ inch hole in ⅝-inch iron, 3¼ inches from edge; will cut ½-inch round iron; will cut ½-inch square iron. Weight, 135 pounds. Machine No. 40 will shear ⅝-inch strap iron, 3 inches wide, or same 6 inches wide by reversing; will punch ⅞-inch hole in ⅝-inch iron, 5 inches from edge; will cut ⅝-inch round iron any length; will cut ⅝-inch square iron any length. Weight 210 pounds. Machine No. 39 will shear ¾-inch strap iron, 4 inches wide, or same 8 inches wide by reversing; will punch ¾-inch hole in ¾-inch iron, 6 inches from edge; will cut ¾-inch round iron any length; will cut ¾-inch square iron any length.

Manufactured by the Buffalo Forge Co., Buffalo, N. Y.

A FEW nights ago Smith got in a sleeping-car at Pittsburgh, and slumbered peacefully for two or three hours. About midnight he thought he would get out upon the platform for a few moments to breathe the fresh air, and to enjoy the delicious moonlight. He did so, and slammed the door after him. In a minute or two he had breathed enough fresh air, and had gazed sufficiently long upon the moonlight. The door had a spring-lock, and would not open; and, although he thumped and pounded with vigor, the car-keeper did not hear him. So that denuded Smith, dressed in a night-shirt of ridiculous thinness, sat down on the steps while the train went dashing over the Alleghanies. Probably in the whole realm of nature a more disconsolate and melancholy Smith than that shuddering being upon the steps could not be found; and he was mad besides. When the train reached Downington he was discovered. He retained his sitting posture when he was carried into the car, and even when he got home. And now he sits in a chair, with bandages on his head, tallow upon his nose, mustard-plasters upon his back, his feet in hot water, and with enough rheumatism in his bones to go around among the entire Smith family and make each member utterly miserable. When interviewed upon the subject of sleeping-cars and moonlight, Mr. Smith now uses language which no respectable paper can print without endangering the public morals.

Our Directory.

We note the following changes since our last issue. Our readers will do us a great favor by giving us prompt notice of any changes that may come to their knowledge or of any errors that may be noticed in our list:

Atchison, Topeka & Santa Fe.—Geo. L. Sands has resigned as Superintendent of the Southern Division, which has been divided into Las Vegas and Rio Grande Divisions; Charles Dyer is Superintendent of the former, and P. F. Barr of the latter.

Buffalo, New York & Philadelphia.—The office of Purchasing Agent has been abolished, and the purchasing is now done by John Dougherty, Treasurer.

Chicago & West Michigan.—Allan Bourne has been appointed General Purchasing Agent of this road, vice E. A. Hill.

Cincinnati, Hamilton & Dayton.—W. H. Stark is appointed Assistant General Superintendent. He was recently Superintendent of the Dayton & Michigan Division.

Cincinnati, Van Wert & Michigan.—Everett Garrison, Chief Engineer, is now also General Manager, in place of E. C. Dawes. H. H. Garr is now Master Mechanic.

Detroit, Grand Haven & Milwaukee.—Wm. J. Spicer is now General Manager of this road, vice Geo. R. Nash, transferred to other duties on the Grand Trunk road.

Georgia Pacific.—G. S. Barnum has been appointed Superintendent of the Western Division, with office in Columbus, Miss. He was recently on the Richmond & Danville.

Louisville, New Albany & Chicago.—T. L. Dunn has been appointed General Superintendent of this company, vice John MacLeod, resigned. Mr. Dunn was recently on the Hannibal & St. Joseph.

Louisville & Nashville.—The office of General Superintendent previously occupied by J. T. Harahan, now General Manager, has been abolished.

New York Central & Hudson River.—C. E. Garey, Master Car-Builder of the New York & Harlem Division, has resigned his position, it having been decided not to rebuild the car shops of this division, which were recently destroyed by fire.

New York, New Haven & Hartford.—H. Kettendorf, Superintendent of Motive Power, has retired from that position, and is succeeded by John Heaney, Jr., formerly of the Hartford shops, and whose jurisdiction extends over the whole line.

Philadelphia & Reading.—Rufus Blodgett, Superintendent of the New Jersey Southern Division, has been appointed Superintendent of the New York & Long Branch road, vice H. H. Nieman. W. W. Stearns, Superintendent of the Central Division, has also been appointed Superintendent of the New Jersey Southern in place of Mr. Blodgett.

Pittsburgh & Western.—The authority of J. T. Johnson, Superintendent, has been extended over the Pittsburgh, Cleveland & Toledo road, superseding W. C. Agnew, the previous Superintendent of the latter road.

Texas & St. Louis.—J. J. Frey has resigned his position as Division Superintendent of the Iron Mountain road to accept a position as General Superintendent of this road. A. E. Buchanan retires from the position of Division Superintendent.

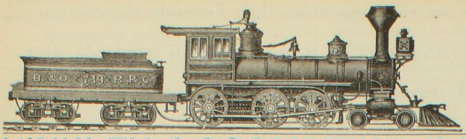
Toledo, Ann Arbor & Grand Trunk.—This road has been consolidated with the Toledo, Ann Arbor & North Michigan, under the name of the latter company.

Toledo, Cincinnati & St. Louis.—The Southeastern Division (from Dayton to Ironton) and the Dayton Division (from Delphos to Dayton) have been sold by the U. S. Court to the purchasing committee of bondholders, and placed in charge of C. E. Henderson (General Manager of the Indiana, Bloomington & Western) as their General Manager.

Valley (Ohio).—Isaac Reynolds (late General Live Stock Agent of the Lake Shore & Michigan Southern road) has been appointed General Superintendent of this road, vice James E. Turk, resigned.

Employment.

WANTED.—A situation by a Master Car-Painter, who is a reliable and thorough mechanic. Address, M. C. P., office of NATIONAL CAR-BUILDER.



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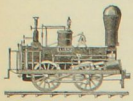

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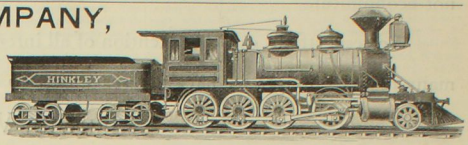

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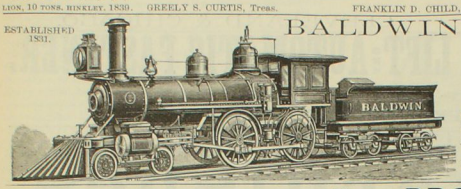

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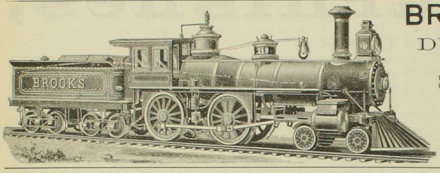
LOCOMOTIVE ENGINES, CAPACITY 600.

Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts of different engines of same class perfectly interchangeable.

Passenger and Freight Locomotives, Mine Locomotives, Narrow Gauge Locomotives, Steam Street Cars, etc. Illustrated Catalogues furnished on application of customers. All work thoroughly guaranteed.



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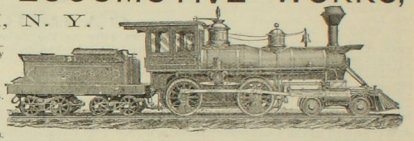

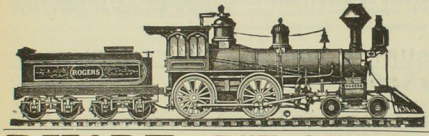

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R. S. HUGHES, Treas., 44 Exchange Place, New York.

RHODE ISLAND LOCOMOTIVE WORKS,

PROVIDENCE, RHODE ISLAND.

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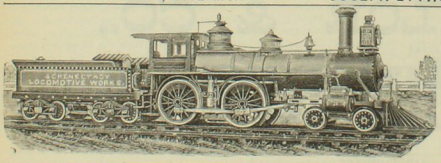
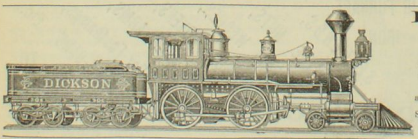


SCHENECTADY LOCOMOTIVE WORKS.

CHAS. G. ELLIS, President. WALTER McQUEEN, Vice-President. EDWARD ELLIS, Treasurer. A. J. PITKIN, Superintendent.

SCHENECTADY, N. Y.



DICKSON MANUFACTURING CO.

Scranton and Wilkes-Barre, Pa.,

MANUFACTURERS OF

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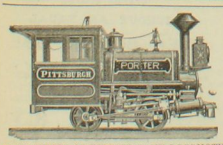
MINING, HOISTING and PUMPING MACHINERY a specialty. Car Wheels, Forgings, and Machinery of all kinds. Specifications and plans furnished on application. General Office, Scranton, Pa.

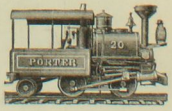
H. M. BOIES, President. JAS. P. DICKSON, Vice-President. WM. H. PERKINS, Sec'y and Treas. E. D. LEAVITT, Jr., M. E., Cambridgeport, Mass., Consulting Engineer.



FOUR-WHEEL-CONNECTED TANK LOCOMOTIVE

H. K. PORTER & CO.,

PITTSBURGH PA.



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Builders of all Kinds of

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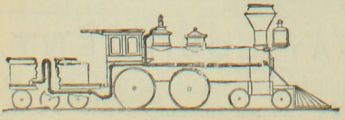


THE ASHTON VALVE COMPANY,

271 Franklin Street, Boston, Mass.

The Ashton Blow-back Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke-box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety-valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam noiseless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus *stops the noise! saves fuel! and all engines steam better and faster, and do more effective work with these valves* than with those in ordinary use.

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars.
C. E. Durkee, Supt ..... Saratoga, N. Y.
Jacob Myers, M. M ..... Saratoga, N. Y.
Jas. J. Traver, M. C. B ..... Saratoga, N. Y.
Addison & Northern Penn'a Ry. 3 g. 46 m. 5 lo. 50 c.
F. M. Baker, Gen. Supt ..... Addison, N. Y.
Alabama Great So'n R. R. (See Cin., N. O. & T. P.)
Albany & Susquehanna R. R. (See D. & H. Canal Co.)
Albemarle & Raleigh R. R. 4-8½ g. 33 m. 3 lo. 35 c.
Jas. H. Petty, Gen. Supt ..... Tarboro, N. C.
Albert Ry. 4-8½ g. 51 m. 3 lo. 35 cars.
G. A. Robinson, Man. & Pur. Agt. Hillsboro, N. B.
Jas. McKay, M. M. & C. B ..... Hillsboro, N. B.
Alexandria & Fredericksburg Ry. } See Penna. R. R.;
Alexandria & Washington R. R. } (7) Div.
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2202 c.
David McCargo, Gen. Supt. & Pur. Agt.; and
C. B. Price, Supt. (Riv. Div.) ..... Pittsburg, Pa.
A. A. Jackson, Supt. (L. G. Div.). Reynoldsville, Pa.
W. A. Wood, M. M ..... Verona, Pa.
R. Gunning, M. C. B ..... Verona, Pa.
Alliance, Niles & Ashtabula R. R. (See Penna. Co.)
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, Supt. & Pur. Agt.. Annapolis, Md.
John L. Beall, M. Mach ..... Annapolis. Md.
Antwerp & Paulding R. R. 4-8½ g. 6 m. 4 lo. 63 c.
E. C. Munson, Gen. Man ..... Antwerp, O.
William Fitzsimmons, Jr., Pur. Agt. Antwerp, O.
Arizona & New Mexico Ry. 3 g. 71 m. 3 l. 60 cars.
W. H. Jones, Gen. Supt. & P. A. Lordsburg, N. M.
W. C. Boylan, M. M. & M. C. B. Lordsburg, N. M.
Arkansas Midland R. R. 3-6 g. 63 m. 4 lo. 45 cars.
A. H. Johnson, Pr. & Gen. Man... Helena, Ark.
J. B. Johnson, M. M. & M. C. B... Helena, Ark.
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, Supt. & Pur. Agt.. Spart'b'g, S. C.
M. M ..... Spartanburg, S. C.
W. B. Brown, M. C. B ..... Spartanburg, S. C.
Ashland Coal & Iron Ry. 4-8½ g. 22 m. 7 lo. 432 c.
Douglas Putnam, Jr., Gen. Supt. Ashland, Ky.
Robt. Peebles, Pur. Agt ..... Ashland, Ky.
E. M. Roberts, M. M ..... Ashland, Ky.
Ashtabula & Pittsburgh Ry. (See Penna. Co.)
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,620 m. 348 lo. 9,629 cars.
A. A. Robinson, Gen. Man ..... Topeka, Kan.
Geo. B. Harris, Asst. Gen. Man... Topeka, Kan.
Geo. Hackney, Supt. Mach ..... Topeka, Kan.
Clem. Hackney, Asst. Sup. Mach. Dept. do.
Geo. Hargraves, Pur. Agt ..... Topeka, Kan.
Eastern Div.: D. J. Chase, Supt. .. Topeka, Kan.
Henry Hull, G. F. Car Dept ..... Topeka, Kan.
John Fagan, M. M ..... Atchison, Kan.
J. M. Smith, M. M ..... Kansas City, Mo.
Alfred Taylor, M. M ..... Emporia, Kan.
Mid. Div.: H. R. Nickerson, Supt. Nickerson, Kan.
W. Y. Johnson, M. M ..... Nickerson, Kan.
..... Dodge, Kan.
W. Div.: C. M. Rathburn, Supt ..... La Junta, Col.
A. C. Stiles, M. M ..... La Junta, Col.
D. H. Dotterer, M. M ..... Raton, N. M.
Las Vegas Div.: Chas. Dyer, Supt. Las Vegas, N. M.
F. B. Woodruff, M. M ..... Las Vegas, N. M.
J. H. Holman, M. M ..... Wallace, N. M.
Rio Gr. Div.: P. F. Barr, Supt. San Marcial, N. M.
E. Hackett, M. M ..... San Marcial, N. M.
H. P. Olcott, M. M ..... Deming, N. M.
Geo. A. Hancock, M. M ..... El Paso, Tex.
Sonora Div.: 265 m.
L. H. Waugh, M. M ..... Guaymas, Mex.
Kan. Cy., Law. & So. Kan.
4-8½ g. 399 m. 24 lo. 787 c.
J. L. Barnes, Supt ..... Lawrence, Kan.
T. D. Volk, M. M ..... Ottawa, Kan.
Atlanta & West Point R. R. (See Western of Ala.)
Atlantic & North Carolina R. R. (See Midland; N. C.)
Atlantic, Tenn. & Ohio R. R. (See Rich. & Dan.; (2) Div.)
Atlantic & Pacific R. R. 4-8½ g. 575 m.
F. W. Smith, G. Supt ..... Albuquerque, N. M.
A. G. Thompson, Pur. Agt.. ... St. Louis, Mo.
Geo. Chalender, Supt. M. P. & M., and
Geo. F. Chalender, A. Supt. Albuquerque, N. M.
Div. Supt ..... Williams, Ariz.
Augusta & Knoxville R. R. (See Port Royal & Aug.)
Austin & Northwestern R. R. 3 g. 60 m. 5 lo. 75 c.
J. A. Rhomberg, Gen. Man ..... Austin, Tex.

B

Bachman Valley R. R. (See Han. Junc., Han. & Gett.)
Balt. & Delaware Bay R. R. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, Gen. M. & P. A. Chestertown, Md.
Baltimore & Hanover R. R. (See H. J., H. & G.)
Baltimore & Ohio R. R.
4-8½ g. 1,612 m. 574 lo. 17,339 cars.
S. Spencer, 2d V. P. & Gen. Man. Baltimore, Md.
N. S. Hill, Pur. Agt ..... Baltimore, Md.
Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, Mast. Trans. Baltimore, Md.
A. J. Cromwell, Act. M. of M.. Baltimore, Md.
Jno. W. Clark, M. C. B ..... Baltimore, Md.
I. N. Kalbaugh, M. M ..... Baltimore, Md.
Wm. Edwards, M. M... Martinsburg, W. Va.
Sam. Houston, M. M ..... Piedmont, W. Va.
Robert Maxwell, M. M ..... Cumberland, Md.
S. B. Crawford, M. M ..... Grafton, W. Va.
Alex. Laird, M. M ..... Parkersburg, W. Va.
W. B. McClung, M. M ..... Wheeling, W. Va.
Pitts. Div.: T. M. King, Gen. Supt... Pittsburg, Pa.
J. E. Sampsell, Ast. M. of M. Connellsville, Pa.
Trans-Ohio Divs.: G. J. Foreacre, G. Man Newark, O.
W. H. Harrison, Asst. M. of Mach.. Newark, O.
E. L. Weisgerber, M. M ..... Newark, O.
H. M. Ingler, M. M ..... Bellaire, O.
O. B. Perkins, M. M ..... Zanesville, O.
Andrew Beckert, M. M ..... Sandusky, O.
F. J. Gunther, M. M ..... Chicago Junction, O.
Chi. Div.: Gen. Supt ... Chicago, Ill.
Benj. Lowther, M. M ..... Garrett, Ind.
W. H. Wilkinson, M. M ..... Kingston, Ill.
Baltimore & Philadelphia. 4-8½ g. 20 m. 4 lo. 35 c.
D. Connell, Supt ..... Wilmington, Del.
Baltimore & Potomac R. R. (See Penna. R. R.; (7) Div.)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, Supt. & Pur. Agt.. Bangor, Me.
C. S. Nason, M. M ..... Bangor, Me.
J. W. Comins, M. C. B ..... Oldtown, Me.
Bangor & Portland Ry. 4-8½ g. 25 m. 3 lo. 3 c.
C. Miller, Pres ..... Blairstown, N. J.
Barclay R. R. 4-8½ g. 16 m. 6 l. 200 c.
F. F. Lyon, Supt ..... Barclay, Pa.
J. A. Hardenburg, Pur. Agt.. 21 Cort. st., N. Y.
Wm. Johnson, M. M ..... Towanda, Pa.
Batesville & Brinkley R. R. 3 g. 25 m. 2 lo. 34 c.
R. W. Martin, Pres ..... Little Rock, Ark.
W. J. Thompson, Gen. Man.. Little Rock, Ark.
E. Summerfield, Gen. Supt ..... Brinkley, Ark.
R. B. Davis, Pur. Agt ..... Brinkley, Ark.
John White, M. M ..... Brinkley, Ark.
Baton Rouge, Grosse Tête & Opelousas R. R.
5-6 g. 29 m. 3 lo. 12 c.
D. C. Montan, Gen. Supt ..... Port Allen, La.
Bedford & Bloomfield Ry. 3 g. 43 m. 5 lo. 65 cars.
Jas. W. Kennedy, Gen. Supt. & Pur. Agt.; and
Capt. Geo. Elliott, M. M ..... Bedford, Ind.
Richard G. Elliott, M. C. B ..... Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 5 lo. 71 c.
S. L. Mooney, Gen. Supt ..... Woodsville, O.
J. B. Hong, M. M ..... Bellaire, O.
Bell's Gap R. R. 4-9 g. 23 m. 4 lo. 148 cars.
R. G. Ford, Supt ..... Bellwood (P. O.), Pa.
Geo. Van Brunt, M. M ..... Bellwood, Pa.
A. Zimmerman, M. C. B ..... Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
W. P. Ijams, Supt ..... Indianapolis, Ind.
Bennington & Rutland Ry. 4-8½ g. 59 m. 10 lo. 236 c.
F. C. White, Supt. & Pur. Agt.. Bennington, Vt.
G. W. Blanchard, M. M ..... Rutland, Vt.
Berlin Branch R. R. (See Han. Junc., Han. & Gett.)
Bingham, Canyon & Camp Floyd (See Den. & Rio Gr.)
Bladen, Columbus & Florida. 4-8½ g. 16 m. 2 lo. 2 c.
John Colville, Pres ..... Wilmington, N. C.
Bodie & Benton Ry. 3 g. 34 miles.
Thomas Holt, Supt. & Pur. Agt ..... Bodie, Cal.
E. H. Barton, M. M. & C. B ..... Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 37 m. 8 lo. 108 c.
H. H. Marshall, Supt. & P. A.. Worcester, Mass.
Frank I. Goodwin, M. M ..... Worcester, Mass.
Boston, Concord, Montreal & White Mts. R. R.
4-8½ g. 107 m. 40 lo. 1,116 cars.
W. A. Stowell, Supt ..... Plymouth, N. H.
Geo. W. Storer, Pur. Agt ..... Boston, Mass.
R. Adams, M. M ..... Lake Village, N. H.
G. A. Ferguson, Asst. M. M... Lake Village, N. H.
L. D. Pickering, M. C. B.... Lake Village, N. H.
Whitefield & Jefferson Div.:
A. L. Brown, Supt ..... Whitefield, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 87 m. 18 lo. 1,038 cars.
H. L. Morrill, Gen. Man.. Mechanicsville, N. Y.
C. H. Cory, Pur. Agt ..... Mechanicville, N. Y.
C. H. Cory, Supt. & M. M.. Mechanicville, N. Y.
John S. Ellis, M. C. B ..... Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 7 lo. 46 c.
C. A. Hammond, Supt. & P. Agt. Boston, Mass.
R. D. Sutherland, M. M ..... Boston, Mass.
John Coghlan, M. C. B ..... Boston, Mass.
Boston, Winthrop & Point Shirley R. R.
3 g. 10 m. 1 lo. 8 c.
C. A. Parks, Supt ..... Boston, Mass.
J. W. Davis, M. M ..... Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, Gen. Supt ..... Boston, Mass.
E. Gallup, Asst. Supt ..... Springfield, Mass.
A. B. Underhill, Supt. M. P... Springfield, Mass.
F. D. Adams, Gen. M. C. B ..... Allston, Mass.
H. B. Chesley, Div. Supt ..... Boston, Mass.
G. H. Colby, Div. M. M ..... Boston, Mass.
C. E. Grover, Div. Supt ..... Springfield, Mass.
H. W. Eddy, Div. M. M ..... Springfield, Mass.
J. B. Weston, For. Car Sh. Springfield, Mass.
W. H. Russell, Jr., Div. Supt. E. Albany, N. Y.
T. B. Purvis, Div. M. M.. East Albany, N. Y.
J. E. Doran, For. Car Sh.. East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 82 lo. 2,565 cars.
C. S. Mellen, Supt ..... Boston, Mass.
F. H. Nourse, Pur. Agt ..... Boston, Mass.
Jas. K. Taylor, Supt. M. P.... Concord, N. H.
So. Div.: J. F. Crockett, Supt ..... Boston, Mass.
No. Div.: Geo. E. Todd, Supt ..... Concord, N. H.
Wh. Mount Div.: W. A. Stowell, Supt. Concord, N. H.
Boston & Maine R. R. 4-8½ g. 206 m. 89 lo. 2,209 c.
J. T. Furber, Gen. Supt. & P. A.. Boston, Mass.
Geo. J. Fisher, Pur. Agt ..... Boston, Mass.
Wm. Smith, M. M ..... Boston, Mass.
D. C. Richardson, M. C. B ..... Lawrence, Mass.
Boston & N. Y. Air Line R. R. (See N. Y., N. H. & H.)
Boston & Providence R. R. 4-8½ g. 67 m. 53 lo. 1,006 c.
A. A. Folsom, Gen. Supt. & P. A. Boston, Mass.
Geo. Richards, M. M ..... Roxbury, Mass.
Jno. Lightner, M. C. B ..... Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 6 m. 2 lo. 4 c.
Wm. A. Wiggins, Gen. Man. Bowling Green, O.
Wm. A. Wiggins, Pur. Agt.. Bowling Green, O.
Bradford, Bordell & Kinzua R. R. 3 g. 42 m. 6 lo. 82 c.
Bradford, Eldred & Cuba. 3 g. 54 m. 6 l. 158 c.
Tonawanda Valley & Cuba. 3 g. 60 m. 5 lo. 31 c.
B. C. Williams, Gen. Man. & P. A.. Brad'fd. Pa.
Jno. Delaney, M. M. & C. B ..... Bradford, Pa.
Brattleboro' & Whitehall R. R. 3 g. 36 m. 3 lo. 56 c.
(Operated by Central Vermont.)
Breakwater & Frankford R. R. (See Del., Md. & Va.)
Bridgton & Saco River R. R. 2 g. 16 m. 2 lo. 19 c.
Wm. F. Perry, Gen. Supt ..... Bridgton, Me.
M. M. Caswell, M. M. & Pur. Agt. Bridgton, Me.
Brighthope Ry. 3 g. 37 m. 4 lo. 193 cars.
Jas. R. Worth, Supt ..... Richmond, Va.
P. M. Buckingham, Pur. Agt. Richmond, Va.
A. Gary, Supt. Way & Works. Winterpock, Va.
Robt. Kredell, M. M ..... Chester, Va.
Brooklyn, Bath & Coney Island R. R.
4-8½ g. 7 m. 8 lo. 36 cars.
Geo. A. Gunther, Gen. Man... Brooklyn, N. Y.
Aug. Wolff, M. M ..... Brooklyn, N. Y.
Brooklyn, Flatbush & Coney Island Ry.
4-8½ g. 7 m. 7 lo. 54 c.
J. L. Morrow, Supt. & P. A... Brooklyn, N. Y.
Wm. Finley, M. M ..... Brooklyn, N. Y.
Brooklyn & Rockaway Beach R. R.
4-8½ g. 3 m. 2 lo. 18 cars.
Wm. Warner, Supt.. ... East New York, N. Y.
Brunswick & Western R. R. 5 g. 172 m. 13 lo. 170 c.
H. S. Morse, Gen. Man. & P. A.. Brunswick, Ga.
R. J. Evans, Supt ..... Brunswick, Ga.
W. R. Kline, M. M ..... Brunswick, Ga.
Buff., N. Y. & Phil. R. R. 3 & 4-8½ g. 655 m. 120 l. 6,339 c.
Geo. S. Gatchell, Gen. Supt ..... Buffalo, N. Y.
W. W. Halsey, Asst. to G. Supt.. Buffalo, N. Y.
Allen Vail, Supt. M. P. & M ..... Buffalo, N. Y.
Buff. Div.: Henry Dwyer, Supt ..... Buffalo, N. Y.
Roch. Div.: J. W. Watson, Supt ..... Olean, N. Y.
Pitts. Div.: E. H. Witter, Supt ..... Oil City, Pa.
H. J. Bookhammer, M. M ..... Oil City, Pa.
John Monks, M. C. B ..... Oil City, Pa.
C. E. Turner, M. M ..... Olean, N. Y.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 713 m. 76 lo. 3,006 cars.
C. J. Ives, Pres ..... Cedar Rapids, Ia.
Robt. Williams, Gen. Supt .... Cedar Rapids, Ia.
T. Stickney, Pur. Agt ..... Cedar Rapids, Ia.
R. W. Bushnell, M. M. & C. B. Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, Gen. Man. & Supt. Burlington, Vt.
F. G. Brownell, M. M., M. C. B. & P. A. do.
Burlington & Mo. Riv. R. R. (in Neb.) (See C. B. & Q.)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 97 c.
Burlington & Western R. R. 3 g. 15 m. 38 c.
W. B. Jones, Supt ..... Burlington, Ia.
Burlington & Ohio River R. R. 4-8½ g.
R. Tanner, Pur. Agt ..... Chicago, Ill.

C

California Northern R. R. 4-8½ g. 26 m. 2 lo. 17 c.
Andrew J. Binney, Gen. Man.. Marysville, Cal.
California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, Supt ..... National City, Cal.
J. M. Keith, M. M ..... National City, Cal.
Cambridge & Seaford. (See Penna. R. R.; (4) Div.)
Camden Atlantic R. R. (See Penna. R. R.; (2) Div.)
Canada Southern Ry. (See Mich. Cen.; (2) Div.)
Canada Atlantic Ry. 4-8½ g. 82 m.
D. C. Linsley, Man ..... Ottawa, Ont.
M. Donaldson, M. M ..... Ottawa, Ont.
Canadian Pacific R. R. 4-8½ g. 1,742 m. 118 l. 2,726 c.
W. C. Van Horne, Gen. Man.... Montreal, Que.
T. G. Shaughnessy, Asst. G. M. Winnipeg, Man.
T. R. F. Brown, Mech. Supt ..... Montreal, Que.
T. G. Shaughnessy, Pur. Agt ..... Montreal, Que.
E. Div.: Archer Baker, Gen. Supt. Montreal, Can.
Tho. Irwin, Mech. Supt ..... Brockville, Ont.
W. Div.: J. M. Egan, Gen. Supt.. Winnipeg, Man.
F. C. Butterfield, M. M. & M. C. B. Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 112 m. 7 lo. 60 c.
J. S. Morrison, Gen. Supt ..... Fayetteville, N. C.
Isaac W. Clark, M. M. & C. B.. Fayetteville, N. C.
Cape Girardeau Southwestern Ry.
4-8½ g. 33 m. 3 lo. 20 cars.
Louis Houck, Gen. Man.. Cape Girardeau, Mo.
W. A. Penney, Gen. Supt. Cape Girardeau, Mo.
W. H. Wheeler, Pur. Agt. Cape Girardeau, Mo.
Fred Glover, M. M ..... Cape Girardeau, Mo.
Carolina Central R. R. (See Ral. & Aug.)
Carson & Colorado R. R. (See Va. & Truckee).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 581 c.
C. W. Chapman, Supt. & P. A. Catasauqua, Pa.
J. Thomas, M. M ..... Hokendauqua, Pa.
Chas. J. Holbach, M. C. B ..... Catasauqua, Pa.
Catskill Mountain R. R. 3 g. 16 m. 2 lo. 26 cars.
Charles A. Beach, Supt ..... Catskill, N. Y.
Cazenovia, Canastota & De Ruyter. (See U., I. & E.)
Central and South-Western Railroads (Ga.).
5 g. 1,115 m. 145 lo. 2,008 cars.
W. G. Raoul, Pres ..... Savannah, Ga.
Wm. Rogers, Gen. Supt ..... Savannah, Ga.
C. H. Carson, Pur. Agt ..... Savannah, Ga.
Cen. Div.: D. D. Arden, M. M ..... Savannah, Ga.
T. F. Warwick, M. M ..... Augusta, Ga.
F. Devine, M. C. B ..... Savannah, Ga.
So.-West'n Div.: T. D. Kline, Supt ..... Macon, Ga.
D. M. Gugel, M. M ..... Macon, Ga.
James A. Knight, M. C. B ..... Macon, Ga.
Central R. R. of N. J. (See Phil. & Read.; N. J. Cen. Div.)
Central R. R. of S. C. (See Wil. & Wel.)
Central American & Pacific Ry. 3 g. 67 m. 1 lo. 11 c.
W. C. Fitzsimmons, Gen. Supt.. Escuintla, Guat.
Central Branch Union Pac. (See Mo. Pac.; (3) Div.)
Central Iowa Ry. 4-8½ g. 412 m. 50 lo. 1,959 cars.
E. L. Dudley, Supt ..... Marshalltown, Ia.
J. G. Johnston, Asst. Supt ..... Marshalltown, Ia.
D. D. Phelps, Asst. Supt ..... Monmouth, Ill.
W. R. Coppock, Asst. Pur. Agt. Marshalltown, Ia.
John Player, M. M ..... Marshalltown, Ia.
T. L. Seevers, M. C. B ..... Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 33 m. 4 lo. 66 cars.
G. W. McMullen, Gen. Man ..... Picton, Ont.
James Falconar, M. M ..... Trenton, Ont.
Central Pac. R. R. 4-8½ g. 4,303 m. 382 lo. 11,260 c.
A. N. Towne, Gen. Man ... San Francisco, Cal.
J. A. Fillmore, Gen. Supt... San Francisco, Cal.
R. H. Pratt, A. G. Supt ... San Francisco, Cal.
J. R. Watson, Gen. Pur. Agt.. Sacramento, Cal.
A. J. Stevens, Gen. M. M ..... Sacramento, Cal.
W. McKenzie, Asst. G. M. M.. Sacramento, Cal.
Benj. Welch, Gen. M. C. B ..... Sacramento, Cal.
G. J. Turner, Asst. G. M. C. B. Sacramento, Cal.
Western: Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, Supt ..... W. Oakland, Cal.
G. D. Welch, M. M. (W. Div.) W. Oakland, Cal.
W. B. Ludlow, M. C. B. (W. Div.) do.
S. Johnson, M. M. (T. Div.) ..... Tulare, Cal.
D. Rutherford, M. M. (N. Rd.). S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, Supt ..... Sacramento, Cal.
M. W. Cooley, M. M. (S. Div.) Sacramento, Cal.
Truckee Div.: J. H. Whited, Supt. Wadsworth, Nev.
Geo. Gregg, M. M ..... Wadsworth, Nev.
Wm. McPherson, F. Car Sh.. Wadsworth, Nev.
Humb't Div.: G. W. Coddington, Supt. Carlin, Nev.
W. F. Smith, M. M ..... Carlin, Nev.
J. C. Doughty, For. Car Sh ..... Carlin, Nev.
Salt Lake Div.: A. G. Fell, Supt ..... Ogden, Utah.
James Lamb, M. M ..... Terrace, Utah.
A. Sherburne, For. Car Sh ..... Ogden, Utah.
Colorado Div.: C. B. Seymour, Supt. Needles, Cal.
St. & Cop. R. R.: R. L. Myrick, Supt.. Stockton, Cal.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, Asst. Supt ..... Los Angeles, Cal.
James Velsir, M. M ..... Los Angeles, Cal.
T. T. Gilleland, For. Car Sh. Los Angeles, Cal.
Arizona Divs. (So. Pac.):
J. A. Muir, Asst. Supt ..... Tucson, Ariz.
W. F. Smith, M. M ..... Tucson, Ariz.
Rio Grande (S. Pac.) & El Paso (G. H. & S. A.) Divs.:
J. Campbell, Supt ..... El Paso, Texas.
J. L. Bonner, M. M ..... El Paso, Texas.
H. C. Standish, For. Sh ..... El Paso, Texas.
Galveston, Harrisburg & San Antonio System.
E. G. Thompson, Supt ..... Houston, Tex.
San Anto. Div.: W. G. Van Vleck, Supt.. and
J. J. Ryan, M. M ..... San Antonio, Tex.
D. T. Davis, Supt. Car Shops. Harrisburg, Tex.
Louisiana Div.: W. Irwin, Supt ..... Houston, Tex.
D. C. Smith, M. M ..... Houston, Tex.
El Paso Div.: Jas. Campbell, Supt.. El Paso, Tex.
J. L. Bonner, M. M ..... El Paso, Tex.
Central Texas & N'w'n R. R. (See Hous. & Tex. Cen.)
Central Vermont R. R. 4-8½ g. 673 m. 136 lo. 2,789 c.
J. W. Hobart, Gen. Man ..... St. Albans, Vt.
J. M. Foss, Asst. Gen. Supt. & M. M. St. Albans, Vt.
No. Div.: I. B. Futvoye, Supt ..... St. Johns, P. Q.
Rut. Div.: J. Burdett, Supt ..... Rutland, Vt.
N. L. Davis, M. M. & C. B ..... Rutland, Vt.
Brattleboro & Whitehall R. R., and
Brat. Div.: E. F. Brooks, Supt... Brattleboro, Vt.
New London No'n R. R. 143 m. 22 lo. 303 c.
C. F. Spaulding, Supt. & P. A. New London, Ct.
I. W. Dow, M. M ..... New London, Ct.
S. O. Banks, M. C. B ..... New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 m. 1 lo. 12 c.
W. Hutchings, Gen. Man ..... Chagrin Falls, O.
J. W. Williams, Gen. Supt ..... Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 190 c.
H. S. Haines, Gen. Man ..... Savannah, Ga.
C. S. Gadsden, Gen. Supt ..... Charleston, S. C.
H. A. Ulmo, M. M ..... Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (See Rich. & D.)
Chateaugay R. R. 3 g. 34 m. 7 lo. 365 cars.
A. L. Inman, Gen. Man ..... Plattsburg, N. Y.
J. M. Davies, Supt ..... Lyon Mountain, N. Y.
M. L. French, Asst. Supt ..... Plattsburg, N. Y.
Chattaroi Ry. 4-8½ g. 51 miles 11 loco. 483 cars.
F. H. Oliphant, Gen. Man. & P. A. Ashland, Ky.
J. R. Martin, M. M ..... Ashland, Ky.
Joseph P. Burleigh, M. C. B ..... Ashland, Ky.
Cheraw & Chester R. R. (See Rich. & Dan.; (2) Div.)
Cheraw & Darlington R. R. (See Wil. & Wel.)
Cheraw & Salisbury R. R. (See Wil. & Wel.)
Cherokee R. R. (See East & West.)
Cherry Valley R. R. 4-8½ g. 6 m. 3 lo. 6 cars.
E. T. Herndon, Supt ..... Midland, Mo.
Chesapeake, Ohio & South-Western.
4-9 g. 398 m. 62 lo. 1,345 c.
Gen. Supt ..... Louisville, Ky.
H. E. Huntington, Pur. Agt ..... Louisville, Ky.
J. E. Reeves, Supt. Trans ..... Louisville, Ky.
R. H. Briggs, Supt. M. P ..... Paducah, Ky.
D. L. Weaver, M. M ..... Elizabethtown, Ky.
Jno. Fitzgerald, M. M ..... Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 169 l. 5,120 c.
C. W. Smith, Gen. Man ..... Richmond, Va.
D. A. Sweet, Asst. to Gen. Man. Richmond, Va.
A. S. Emmons, Pur. Agt ..... Richmond, Va.
T. L. Chapman, Supt. M. P ..... Richmond, Va.
Eastern Div.: A. H. Wood, Supt.. Richmond, Va.
J. N. King, M. C. B ..... Richmond, Va.
J. B. Pierce, M. M ..... Richmond, Va.
Hunt. Div.: W. B. Ryder, Supt ..... Hinton, W. Va.
W. H. Thomas, M. M... Huntington, W. Va.
H. C. Bassinger, M. C. B. Huntington, W. Va.
Lex. Div.: J. D. Yarrington, Supt.. Lexington, Ky.
S. R. Tuggle, M. M ..... Lexington, Ky.
K. C. Div.: G. W. Bender, Supt.. Lexington, Ky.
A. H. Watts, M. M ..... Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 31 lo. 531 cars.
R. Stewart, Gen. Man ..... Keene, N. H.
H. H. Stone, Pur. Agt ..... Keene, N. H.
F. A. Perry, M. M ..... Keene, N. H.
A. E. Howard, M. C. B ..... Keene, N. H.
Chester & Lenoir Ry. (See Rich. & Dan.; (3) Div.)
Chicago, Bur. & Kan. City Ry. (See C. B. & Q.)
Chicago, Burlington & Quincy R. R.
4-8½ g. 3,608 m. 545 lo. 21,012 cars.
T. J. Potter, Gen. Man ..... Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv.
H. B. Stone, Asst. Gen. Man ..... Chicago, Ill.
Wm. Irving, Gen. Pur. Agt ..... Chicago, Ill.
G. W. Rhodes, Supt. M. P ..... Aurora, Ill.
Wm. Forsyth, Mech. Eng ..... Aurora, Ill.
Ill. Divs.: J. D. Besler, Supt ..... Galesburg, Ill.
Chi. Div.: Geo. Alexander, Supt ..... Aurora, Ill.
L. E. Johnson, M. M ..... Aurora, Ill.
Galesburg Div.: F. C. Rice, Supt. Galesburg, Ill.
Robert Colville, M. M ..... Galesburg, Ill.
St. L. Div.: S. E. Crance, Supt.. Beardstown, Ill.
A. Forsyth, M. M ..... Beardstown, Ill.
Ia. & Mo. Divs.: W. F. Merrill, Supt. Burlington, Ia.
East. Div.: O. E. Stewart, Supt.. Burlington, Ia.
Joel West, M. M ..... Burlington, Ia.
Mid. Div.: J. B. Maxon, Supt ..... Ottumwa, Ia.
West'n Div.: J. H. Duggin, Supt ..... Creston, Ia.
C. W. Eckerson, M. M ..... Creston, Ia.
Chi., B. & Kan. C'y and St. L., Keo. & No.-W'n Rys.
Robt. Law, Gen. Supt ..... Keokuk, Ia.
W. H. Bartlett, M. M ..... Burlington, Ia.
(2) C. B. & Q., West of Mo. Riv.
G. W. Holdrege, Asst. Gen. Man. Omaha, Neb.
C. M. Wead, Supply Agt ..... Omaha, Neb.
D. Hawksworth, M. M ..... Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
T. E. Calvert, Gen. Supt ..... Lincoln, Neb.
D. E. Thompson, Supt ..... Lincoln, Neb.
E. Bignell, M. M ..... Lincoln, Neb.
R. V. Div.: A. Campbell, Supt ..... McCook, Neb.
A. & N. Div.: J. McConniff, Supt... Lincoln, Neb.
Chicago, Fairchild & Eau Claire R. R.
4-8½ g. 20 m. 3 lo. 28 cars.
N. C. Foster, Gen. Man ..... Fairchild, Wis.
C. I. Wickersham, Pur. Agt ..... Chicago, Ill.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 5,201 m. 626 lo. 19,018 cars.
S. S. Merrill, Gen. Man ..... Milwaukee, Wis.
R. Miller, Asst. Gen. Man... Milwaukee, Wis.
J. T. Clark, Gen. Supt ..... Milwaukee, Wis.
A. J. Earling, Asst. Gen. Supt. Milwaukee, Wis.
J. T. Crocker, Pur. Agt ..... Milwaukee, Wis.
J. M. Lowry, Gen. M. M ..... Milwaukee, Wis.
E. Fairbairn, M. M ..... Milwaukee, Wis.
John Baillie, Supt. Car Dept... Milwaukee, Wis.
W. E. Kittridge, M. C. B ..... Milwaukee, Wis.
C. & C. B. Div. in Ill.:
R. B. Campbell, Supt ..... Marion, Ill.
(1) Asst. Gen. Supt.. Milwaukee, Wis.
Chi. Div.: Geo. O. Clinton, Supt ..... Chicago, Ill.
La Crosse Div.: W. G. Collins, Supt. Milwaukee, Wis.
P. du C. & M. Pt. Divs.:
S. J. Collins, Supt ..... Milwaukee, Wis.
(2) C. H. Prior, Asst. Gen. Supt.. Minneapolis, Minn.
H. & D. Div.: W. M. Kellie, Supt do.
J. O. Pattie, M. M ..... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, Supt. do.
S. Minn. Div.: F. D. Underwood, Supt. Lacrosse, Wis.
Riv. & Dub. Divs.: C. W. Case, Supt. Dubuque, Ia.
S. Charnley, M. M ..... Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, Supt. Mason City, Ia.
S. Cy. & Da. Div.: W. J. Underwood, Supt. Sioux C'y, Ia.
F. H. Moulton, M. M ..... Yankton, Dak.
J. M. Horan, For ..... Yankton, Dak.
(3) D. A. Olin, Asst. Gen. Supt ..... Racine, Wis.
R. & S. W. Divs.: D. L. Bush, Supt... Racine, Wis.
John Taylor, M. M ..... Racine, Wis.
(4) Northern Div.: L. B. Rock, Supt. Milwaukee, Wis.
Wm. E. Kittredge, M. C. B.. Milwaukee, Wis.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 309 lo. 8,367 cars.
R. R. Cable, Pres. & Gen. Man ..... Chicago, Ill.
A. Kimball, V. P. & Gen. Supt ..... Chicago, Ill.
H. F. Royce, Asst. G. Supt ..... Davenport, Ia.
F. A. Marsh, Pur. Agt ..... Chicago, Ill.
T. B. Twombly, Gen. M. M ..... Chicago, Ill.
B. K. Verbryck, Gen. M. C. B ..... Chicago, Ill.
Ill. Div.: R. H. Chamberlin, Supt ..... Chicago, Ill.
R. Biester, M. M ..... Chicago, Ill.
Sam'l Pullman, M. C. B ..... Chicago, Ill.
Ia. Divs.: Jno. Given, Supt ..... Des Moines, Ia.
J. G. Crockett, M. M ..... Stuart, Ia.
Jas. E. Morrill, M. M ..... Davenport, Ia.
Chas. M. Leonard, M. C. B ..... Davenport, Ia.
K. & Des. M. Div.: Jno. Given, Supt.. Des Moines, Ia.
S. W. Wakefield, M. M ..... Keokuk, Ia.
Henry Kummer, M. C. B ..... Keokuk, Ia.
So.-Wn. Div.: G. F. Walker, Supt ..... Trenton, Mo.
R. O. Carscadin, M. M ..... Trenton, Mo.
Chas. R. Best, M. C. B ..... Trenton, Mo.
Chicago, Saginaw & Canada R. R. (See Det., L. & N.)
Chicago, St. Louis & New Orleans R. R. (See Ill. Cen.)
Chicago, St. Louis & Pittsburg R. R.
4-9 g. 635 m. 202 lo. 3,510 cars.
James McCrea, Manager ..... Columbus, O.
Wm. Mullins, Gen. Pur. Agt ..... Pittsburg, Pa.
Edward B. Wall, Supt. M. P ..... Columbus, O.
1, 3 & 5 Divs.: J. F. Miller, Supt. Richmond, Ind.
Robert Curtis, M. M ..... Columbus, O.
J. L. Copeland, G. F. Car Shops. Columbus, O.
W. C. Arp, Gen. For ..... Indianapolis, Ind.
2 & 4 Divs.: Chas. Watts, Supt. Logansport, Ind.
W. W. Reynolds, M. M ..... Logansport, Ind.
Chas. H. Starr, G. F. C. Shops. Logansport, Ind.
Chicago, St. Louis & Wn. R. R. 4-8½ g. 88 m. 11 lo. 1,799 c.
F. E. Hinckley, Gen. Man ..... Chicago, Ill.
A. H. Crocker, Supt ..... Streator, Ill.
J. N. Chilson, M. C. B ..... Streator, Ill.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,280 m. 181 lo. 5,221 cars.
J. M. Whitman, Gen. Supt ..... St. Paul, Minn.
W. H. S. Wright, Pur. Agt ..... St. Paul, Minn.
Matt. Ellis, M. M ..... St. Paul, Minn.
J. J. Ellis, Asst. M. M ..... St. Paul, Minn.
H. L. Preston, M. C. B ..... Hudson, Wis.
Ea. & No. Div.: A. A. Hobart, Supt. St. Paul, Minn.
St. Paul and Sioux City Div.:
H. Spencer, Supt ..... St. James, Minn.
H. C. Anderson, Asst. M. M ..... Sioux C'y, Ia.
Neb. Div.: Jas. McCabe, Supt ..... Omaha, Neb.
Chic., Tex. & Mexican Cent. Ry. (See Gulf, C. & S. F.)
Chicago & Alton R. R. 4-8½ g. 849 m. 213 lo. 6,168 c.
C. H. Chappell, Gen. Man ..... Chicago, Ill.
T. L. Bates, Supt. of Trans... Bloomington, Ill.
A. V. Hartwell, Pur. Agt ..... Chicago, Ill.
Wm. Wilson, Supt. of Mach... Bloomington, Ill.
Jos. Townsend, G. For. Car Dept. do.
Chi. Div.: A. M. Richards, Supt.. Bloomington, Ill.
St. L. & K. C. Div.: S. D. Reeves, Supt. Roodhouse, Ill.
L. H. Miller, M. M ..... Slater, Mo.
Chicago & Atlantic Ry. 4-8½ g. 269 m.
F. Broughton, Gen. Man ..... Chicago, Ill.
J. H. Parsons, Supt ..... Chicago, Ill.
Geo. A. Hill, M. M. & M. C. B.. Huntington, Ill.
Chi. & East'n Ill. 4-8½ g. 252 m. 56 lo. 3,500 cars.
O. S. Lyford, Gen. Supt ..... Chicago, Ill.
D. R. Patterson, Pur. Agt ..... Chicago, Ill.
P. W. Drew, M. Trans ..... Chicago, Ill.
Allen Cooke, M. M ..... Danville, Ill.
Chicago & Grand Trunk Ry. (See Grand Trunk.)
Chicago & Great Southern Ry.
4-8½ g. 124 m. 4 lo. 122 c.
Henry Crawford, Gen. Man ..... Chicago, Ill.
H. Crawford, Jr., Supt ..... Chicago, Ill.
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 237 cars.
T. J. Potter, Gen. Man ..... Chicago, Ill.
W. H. Holcomb, Gen. Supt ..... Rochelle, Ill.
H. S. Bryan, M. M ..... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,761 m. 637 lo. 21,000 cars.
Marvin Hughitt, 2d V. Prs. & G. M. Chicago, Ill.
C. C. Wheeler, Gen. Supt ..... Chicago, Ill.
W. B. Linsley, Ass't Gen. Supt ..... Chicago, Ill.
R. W. Hamer, Pur. Agt ..... Chicago, Ill.
Geo. W. Tilton, Supt. M. P. & M.; and
Wm. Campbell, A. Supt. M. P. & M.. Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Ed. J. Cuyler, Supt ..... Chicago, Ill.
Gal. Div.: Chas. Murray, Supt ..... Chicago, Ill.
Pen'a Div.: W. F. Fitch, Supt ..... Escanaba, Mich.
J. Symons, M. M ..... Escanaba, Mich.
Mad. Div.: C. A. Swineford, Supt.. Baraboo, Wis.
Minn. & Dak. Divs.: S. Sanborn, Asst. Gen. Supt.
and W. A. Scott, M. M ..... Winona, Minn.
Dak. Cen. Ry.: J. S. Oliver, Supt ..... Huron, Dak.
Ia. Div.: H. G. Burt, Supt ..... Boone, Ia.
Geo. W. Lowe, M. M ..... Clinton, Ia.
No. Ia. Div.: M. Hopkins, Supt... Eagle Grove, Ia.
Win. & St. P. Div.:
W. P. Cosgrave, Supt ..... Winona, Minn.
Chicago & West Michigan:
4-8½ g. 409 m. 47 lo. 1,629 cars.
J. B. Mulliken, V. P. & G. Man. Muskegon, Mich.
A. M. Nichols, Gen. Supt ..... Gd. Rapids, Mich.
Allen Bourne, Pur. Agt ..... Muskegon, Mich.
W. F. N. Davis, M. M ..... Muskegon, Mich.
Chicago & West'n Ind. R. R. 4-8½ g. 50 m. 12 lo. 150 c.
James Walsh, Gen. Man ..... Chicago, Ill.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 2 lo. 77 cars.
D. P. Hyatt, Gen. Man ..... Dayton, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 3 lo. 45 c.
M. Simmons, Supt ..... Cincinnati, O.
F. Enler, M. M ..... Cincinnati, O.
Cincinnati & Green River Ry. 3 g. 11 m. 2 lo. 41 c.
G. B. Harper, Supt ..... Grove, Ky.
Geo. W. Lewis, M. M ..... Grove, Ky.
Cin., Hamilton & Dayton R. R. 4-9 g. 352 m. 92 l. 2,932 c.
C. J. Hepburn, Gen. Supt ..... Cincinnati, O.
W. F. Stark, Asst. Supt ..... Toledo, O.
John Black, Gen. M. M ..... Lima, O.
W. H. H. Allison, M. C. B ..... Cincinnati, O.
Day. & Mich. Div.:
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 384 m. 71 lo. 3,279 cars.
J. W. Sherwood, Supt ..... Indianapolis, Ind.
Geo. Tozzer, Pur. Agt ..... Cincinnati, O.
J. S. Patterson, M. of Mach. & M. C. B. Cincinnati, O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 846 m. 123 lo. 3,464 cars.
John Scott, Gen. Man ..... Cincinnati, O.
Richard Carroll, Gen. Supt ..... Cincinnati, O.
R. W. Healey, Gen. Pur. Agt ..... Cincinnati, O.
James Meehan, S. M. P. & M ..... Cincinnati, O.
Cin. So. Div.: W. W. Wells, Supt.. Somerset, Ky.
J. L. Tomlinson, Asst. S. M. P.. Ludlow, Ky.
John Richardson, M. C. B ..... Cincinnati, O.
A. Thomson, M. M ..... Chattanooga, Tenn.
Ala. Gr. S'n Div.: D. McLaren, Supt., and
George Manuell, M. M ..... Chattanooga, Tenn.
J. M. Kelly, M. C. B ..... Chattanooga, Tenn.

V. & M. Div.: E. F. Raworth, Supt., and M. M.....Vicksburg, Miss.
V.S. & P. Div.: F. Y. Dabney, Supt..Monroe, La.
W. Bell Smith, M. M. & C. B.....Monroe, La.
New Orleans & North-Eastern R. R.
T. S. Williams, Supt........New Orleans, La.
I. W. Fowle, M. M............Meridan, Miss.
Cincinnati Northern Ry.
Geo. L. Barringer, Gen. Man....Cincinnati, O.
Cincinnati, Selma & Mobile R.R. 5 g. 71 m. 6 lo. 148 c.
A. McCollister, Supt..............Selma, Ala.
H. L. Wright, Pur. Agt............Selma, Ala.
J. M. Levis, M. M................Marion, Ala.
Cincinnati, Van Wert & Michigan R. R.
4-9 g. 81 m. 7 lo. 168 cars.
E. Garrison, Gen. Man..........Van Wert, O.
D. R. Ennis, Supt. & P. A........Van Wert, O.
H. H. Garr, M. M. & M. C. B......Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 402 c.
Norman Beckley, Gen. Man. & P. A. Elkhart, Ind.
O. W. Lamport, Supt............Wabash, Ind.
S. B. Tinker, M. M. & M. C. B....Wabash, Ind.
Cin., Wash. & Balt. 4-8½ g. 312 m. 65 lo. 1,422 cars
Jas. H. Stewart, Gen. Man.......Cincinnati, O.
Edw. Evans, M. M...............Chillicothe, O.
T. G. Duncan, Supt. Car Dept.......Zaleski, O.
Cincinnati, Wheeling & New York R.R. 4-8½ g. 13 m.
Thos. R. Sharp, Pres..........New York, N. Y.
Cincinnati & Eastern Ry. 3 g. 100 m. 7 lo. 133 cars.
S. Woodward, Gen. Man........Cincinnati, O.
G. H. Wilber, Gen. Sup. & Pur. Agt. Cincinnati, O.
P. W. Naughton, M. M...........Newtown, O.
Cincinnati & South-Eastern Ry. 4-8½ g. 18 m.
John V. Patton, Gen. Man.......Newport, Ky.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 45 cars.
A. H. Kunst, Pres. & Gen. Man. Weston, W. Va.
Sam. A. Steel, M. M...........Weston, W. Va.
F. Dillie, M. C. B.............Nottingham, O.
Cleveland, Columbus, Cincinnati & Indiana and Indianapolis & St. Louis Rys. and Dayton & Union R. R. 4-8½ g. 785 m. 246 lo. 7,988 cars.
E. B. Thomas, Gen. Man.........Cleveland, O.
J. L. Yale, Pur. Agt.............Cleveland, O.
W. F. Turreff, Gen. M. M........Cleveland, O.
Col. & Cin. Div.: Robt. Blee, Supt. Cleveland, O.
Wm. Garsting, M. M.............Cleveland, O.
A. G. Steinbrenner, G. For. Car Dept. do.
Ind'p'lis Div.: John O. Ewan, Supt. Ind'polis, Ind.
T. W. Ranson, M. M.........Brightwood, Ind.
N. Mark, G. For. Car Dept. Brightwood, Ind.
Ind. & St L Ry.: Tho. Burrows, Supt. St. Louis, Mo.
T. W. Ranson, M. M. & C. B. Brightwood, Ind.
Day. & Un. Rd.: J. H. Barrett, Supt. Cincinnati, O.
H. S. Gordon, For. M. Shops......Dayton, O.
Clevel'd, Delphos & St. Louis R.R. 3 g. 56 m. 3 lo. 39 c.
I. H. Burgoon, Gen. Man..........Delphos, O.
B. F. Marshall, M. M.............Delphos, O.
Cleveland, Indiana & St. Louis R. R.
4-8½ g. 19 m. 2 lo. 20 cars.
J. A. Larned, Rec. & Supt.......Anderson, Ind.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 24 lo. 828 c.
N. Monsarrat, Gen. Supt..............Akron, O.
G. M. Taylor, M. M. & C. B.....Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo. 138 c.
D. T. Lumley, Gen. Supt.........Alliance, O.
C. H. Dorman, M. M. & M. C. B....Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 31 lo. 1,878 cars.
Oscar Townsend, Gen. Man......Cleveland, O.
Wm. Thornburg, Supt...............Lorain, O.
W. A. Stone, M. M.................Lorain, O.
Cleve. & Marietta R. R. (See Wheel. & Lake Erie.)
Cleveland & Pittsburg. (See Penna. Co.; (4) Div.)
Clifton & Port Hudson R. R. 4-8½ g. 22 m. 3 lo. 19 c.
D. W. Pipes, Supt..................Clinton, La.
W. F. Lockwood, M. M..............Clinton, La.
Clove Branch R. R. 4-8½ g. 4 m. 1 lo. 61 cars.
C. L. Kimball, Supt.........Mattewan, N. Y.
W. G. Vanbuskirk, M. M...Dutchess Jc., N. Y.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 255 cars.
Jas. R. Barber, Gen. Supt.......Cobourg, Ont.
Jas. Clark, M. M..................Cobourg, Ont.
John Tinney, M. C. B............Cobourg, Ont.
Colorado Central R. R. (See Un. Pac.; (4) Div.)
Columbia & Greenville R. R. (See Rich. & D.; (3) Div.)
Columbia & Puget Sound R.R. 3 g. 21 m. 7 lo. 114 c.
J. L. Howard, Gen. Supt..San Francisco, Cal.
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 324 m. 90 lo. 7,353 cars.
G. R. Carr, Gen. Supt.............Columbus, O.
W. M. Greene, Pur. Agt...........Columbus, O.
Ira G. Hutchins, M. M.............Columbus, O.
J. M. Rockafield, M. C. B.........Columbus, O.
Tol. Div.: M. T. Seymour, Supt......Columbus, O.
Hock. V. Div.: M. P. L. Booth, Supt. Columbus, O.
Ohio Riv. Div.: C. D. Norris, Supt.......Logan, O.
Columbus & Eastern R. R. In progress
J. E. Redfield, Pres..............Columbus, Ohio.
Columbus & Maysville Ry. (See Cin. & East.)
Columbus & Rome R. R. 3 g. 33 m. 3 lo. 30 cars.
M. E. Gray, Supt...................Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 6 lo. 53 cars
E. A. Flewellen, Gen. Man.......Columbus, Ga.
R. A. Bridges, M. M...............Opelika, Ala.
Concord R. R. 4-8½ g. 141 m. 38 lo. 1,235 cars.
H. E. Chamberlain, Supt. & P. Agt. Concord, N. H.
J. T. Gordon, M. M. & C. B.......Concord, N. H.
Concord & Claremont R. R. (See Northern of N. H.
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 42 lo. 554 c.
J. Mulligan, Supt. & Pur. Agt. Springfield, Mass.
W. H. Stearns, M. M. & M. C. B. Springfield, Mass.
Conn. & Passumpsic Rivers R. R. (See Passumpsic.)
Connotton Valley R. R. 3 g. 160 m. 26 lo. 997 cars.
Samuel Briggs, Gen. Man.........Cleveland, O.
B. C. Bosworth, M. M................Canton, O.
Cooperstown & Susquehanna Valley R. R.
4-8½ g. 16 m. 2 lo. 14 cars.
Andrew Shaw, Pres.........Cooperstown, N. Y.
A. Mumford, M. M..........Cooperstown, N. Y.
Corning, Cowanesque & Antrim Ry. (See Syr., G. & C.)
Cornwall R. R. 4-8½ g. 12 m. 5 lo. 166 cars
J. M. Havard, G. Supt. & M. M....Lebanon, Pa.
Levi Blonch, M. C. B................Lebanon, Pa.
Coudersport & Port Allegheny R. R.
3 g. 17 m. 2 lo. 64 cars.
B. A. McClure, Gen. Supt.....Coudersport, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
Wm. Whyte, Gen. Supt..........Toronto, Ont.
John Macnab, Pur. Agt..........Toronto, Can.
D. Preston, Mech. Supt...........Toronto, Can.
Crooked Creek R. R. 3 g. 9 m. 1 lo. 37 cars.
Walter C. Willson, Gen. Man. Webster City, Ia.
Geo. W. Post, Pur. Agt..............Lehigh, Ia.
Crown Point Iron Co. R. R. 3 g. 13 m. 4 lo. 113 c.
A. L. Inman, Gen. Man........Plattsburg, N. Y.
H. L. Reed, Pur. Agt........Crown Point, N. Y.
J. M. Davies, Supt. & M. M..Crown Point, N. Y.
J. C. Sherman, M. C. B......Crown Point, N. Y.
Cumberland Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, Gen. Man.........Parsboro, N. S.
K. McKinnon, M. M...............Parsboro, N. S.
Cumberland Valley R. R. 4-9 g. 127 m. 25 lo. 474 cars.
J. F. Boyd, Supt...........Chambersburg, Pa.
A. S. Hull, M. M...........Chambersburg, Pa.
C. Wicke, M. C. B..........Chambersburg, Pa.
Cumberland & Maurice River R. R. 4-8½ g. 20 m.
L. H. Dowdney, Supt..........Port Morris, N. J.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, Gen Supt & P A. Cumberland, Md.
N. W. Howson, Mast. of Mach. Mt. Savage, Md.
Nathan Binix, M. C. B...........Mt. Savage, Md.

D

Danville & New River R. R. 3 g. 43 m. 2 lo. 30 c.
W. T. Sutherlin, Gen. Man.......Danville, Va.
J. F. Morton, M. M.................Danville, Va.
Danbury & Norwalk R. R. 4-8½ g. 36 m. 7 lo. 112 c.
C. M. Crawford, G. Supt. & P. A. S. Norwalk, Ct.
W. H. Wilkinson, M. M. & C. B. Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. M. Shivler, Supt..........Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 110 m. 5 lo. 83 c.
C. E. Henderson, Rec. & Man.........Olney, Ill.
W. A. Bell, M. M. & C. B..........Kansas, Ill.
Dayton & Union R. R. (See Clev., Col., Cin. & Ind.)
Dayton & Michigan R. R. (See Cin., Ham. & Day.)
Del. Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 930 m. 436 lo. 31,989 cars.
Wm. F. Halstead, Gen. Supt.......Scranton, Pa.
G. W. B. Cushing, Pur. Agt....New York, N. Y.
Walter Dawson, Mast. of Mach...Scranton, Pa.
Robt. McKenna, M. C. B..........Scranton, Pa.
Bloomsb'g Div.: C. Graham, M. M..Kingston, Pa.
Utica Div.: A. C. Salisbury, Supt....Utica, N. Y.
Thos. Thatcher, M. M..............Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, Supt.................Hoboken, N. J.
W. H. Lewis, M. M.............Kingsland, N. J.
J. W. Baker, Mast. Car Rep.......Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, Supt..............Oswego, N. Y.
Jas. Buchanan, M. M...........Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, Gen. Supt.........Syracuse, N. Y.
Jas. Buchanan, M. M...........Syracuse, N. Y.
Cayuga Div.: W. R. Humphrey, Supt. Ithaca, N.Y.
Delaware, Maryland & Virginia R. R.
4-8½ g. 101 m. 7 lo. 145 cars.
Tho. Groom, Supt.....................Lewes, Del.
Geo. Messick, M. M...................Lewes, Del.
W. H. Virden, M. C. B................Lewes, Del.
Delaware River R. R. 4-8½ g. 20 m. 3 lo. 4 cars.
E. H. Green, Supt............Pedricktown, N. J.
Delaware Western R. R. (See Balt. & Phil.)
Delaware & Chesapeake R. R. (See Penna.; (4) Div.)
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 634 m. 180 lo. 10,799 cars.
C. F. Young, Gen. Man..........Honesdale, Pa.
C. F. Young, Pur. Agt.............Albany, N. Y.
R. C. Blackall, Supt. of Mach......Albany, N. Y.
Susq. Div.: C. D. Hammond, Supt. Albany, N. Y..
Tho. Howard, M. M...............Oneonta, N. Y.
J. R. Skinner, M. C. B............Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, Supt...Troy, N. Y.
J. L. Corey, M. M...........Green Island, N. Y.
Chr. Körner, M. C. B.......Green Island, N. Y.
Pa. Div.: R. Manville, Supt. & Pur. Agt. and
S. H. Dotterer, M. M.........Carbondale, Pa.
T. Orchard, M. C. B.........Carbondale, Pa.
Denver Circle R. R. 3 g. 12 m. 7 lo. 15 cars
Theo. C. Henry, Gen. Man.........Denver, Col.
J. H. Bedson, Gen. Supt...........Denver, Col.
Denver, Utah & Pacific R. R. 3 g. 34 m. 2 lo. 58 c.
L. M. Fouts, Supt..................Denver, Col.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, Gen. Man...........Denver, Col.
Chas. Wheeler, Pur. Agt...........Denver, Col.
J. H. Kirk, M. M. & M. C. B.......Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,665 m. 222 lo. 5,932 c.
D. C. Dodge, Gen. Man.............Denver, Col.
C. M. Hobbs, Pur. Agt..............Denver, Col.
N. W. Sample, Supt. M. P. & M....Denver, Col.
(1) Col. & N. M. Div.: R. E. Ricker, G. S. Denver, Col.
1st Div.: W. W. Borst, Supt.......S. Pueblo, Col.
2d Div.: Cole Lydon, Supt.........Alamosa, Col.
3d Div.: G. W. Cook, Supt.........Leadville, Col.
4th Div.: R. M. Ridgway, Supt.......Salida, Col.
(2) Utah Div.: W. H. Bancroft, G. S. S. Lake City, Utah.
Des Moines, Osceola & Southern R. R.
3 g. 100 m. 7 lo. 253 cars.
Henry Stivers, Gen. Supt...........Osceola, Ia.
L. D. Berry, M. M...................Osceola, Ia.
Elias Tonet, M. C. B................Osceola, Ia.
Des Moines & Ft. Dodge. 4-8½ g. 144 m. 13 lo. 350 c.
C. N. Gilmore, Supt..............Des Moines, Ia.
John McGrayel, M. M.......Grand Junction, Ia.
E. A. Avery, M. C. B.........Grand Junction, Ia.
Det., Bay City & Alpena R. R. 3-2 g. 48 m. 5 lo. 227 c.
Milo Eastman, Supt..........East Tawas, Mich.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 39 lo. 696 c.
W. J. Spicer, Gen. Man...........Detroit, Mich.
John S. Lorimer, Storekeeper....Detroit, Mich.
W. J. Morgan, Supt................Detroit, Mich.
H. Roberts, Mech. Supt.........Ft. Gratiot, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c
John B. Mulliken, Gen. Man......Detroit, Mich.
Allan Bourn, Pur. Agt.............Detroit, Mich.
Thos. M. Fish, Gen. Supt............Ionia, Mich.
G. C. Watrous, M. M. & C. B.......Ionia, Mich.
Det., Mack. & Marq. R.R. 4-8½ g. 152 m. 16 lo. 1,112 c.
D. McCool, Gen. Supt. & P. A. Marquette, Mich.
W. J. Tench, Pur. Agt..........Marquette, Mich.
John B. Wilson, Mech. Supt....Marquette, Mich.
Dorchester & Delaware R.R. (See Penna. (4) Del. Div.)
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, Supt...............Waverly, Ia.
W. S. Couch, Pur. Agt..............Dubuque, Ia.
Duck River Valley R. R. (See Nash., Chat. & St. L.)
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, Gen. Supt.............Dunkirk, N. Y.
R. C. Moore, Pur. Agt..........New York, N. Y.
J. C. Haggett, M. M. & C. B.....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 19 cars.
W. W. Barnes, Supt...............Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 7 lo. 260 cars.
A. W. Sims, Supt..................Orbisonia, Pa.
A. W. Greenwood, M. M..........Orbisonia, Pa.
East St. Louis & Carondelet Ry. 4-9 g. 4 lo. 27 c.
Joseph Hill, Gen. Supt.......East St. Louis, Ill.
East Tenn. & Western North Car. R. R.
3 g. 34 m. 2 lo. 70 cars.
Thomas E. Matson, Supt. Elizabethton, Tenn.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,453 m. 173 lo. 3,670 cars.
Henry Fink, V. P. & Gen. Man. Knoxville, Tenn.
J. F. O'Brien, Gen. Supt.........Knoxville, Tenn.
J. E. Wilcox, Pur. Agt..........Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, Supt...............Knoxville, Tenn.
B. J. Sitton, M. M...............Knoxville, Tenn.
Jos. Armbruster, M. C. B....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, Supt...Selma, Ala.
Simon Gay, M. M......................Selma, Ala.
W. W. Pierce, M. C. B...............Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., Supt........Memphis, Tenn.
H. N. Burford, M. M............Memphis, Tenn.
Atlanta Div.: J. W. Fry, Supt........Atlanta, Ga.
W. A. Warden, M. M..................Atlanta, Ga.
J. H. Perkins, M. C. B...............Atlanta, Ga.
Brunswick Div.: J. E. Mallory, Supt. Macon, Ga.
East & West R. R. of Ala. 3 g. 110 m. 9 lo. 85 c.
John Postell, Manager..........Cedartown, Ga.
M. M. & C. B.........Cedartown, Ga.
Eastern R. R. 4-8½ g. 283 m. 110 lo. 2,268 cars.
Payson Tucker, Gen. Man........Boston, Mass.
D. W. Sanborn, Mast. of Trans..Boston, Mass.
G. F. Hurd, Pur. Agt.............Boston, Mass.
Amos Pilsbury, S. M. P. & M...E. Boston, Mass.
A. M. Waitt, G. For. Car Dept.....Salem, Mass.
Con'y Div.: J. W. Sanborn, Supt., Wolfboro J., N.H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 160 c.
H. W. Bates, Man. & Pur. Agt...Riverton, Ky.
H. W. Crawford, M. M.........Hunnewell, Ky.
Eastern (Maine) R. R. (See Maine Central.)
Eastern Shore R. R. 4-8½ g. 38 m. 3 lo. 9 c.
W. Thompson, Supt.........Princess Anne, Md.
F. Strattner, M. M..........Princess Anne, Md.
Elberton Air-Line R.R. (See Rich. & Dan. N. G. Brs.)
Elizabeth City & Norfolk R.R. (See Norfolk So.)
Elizabethtown, Lex. & Big Sandy R.R. (See Ches. & O.)
Emmitsburg R. R. (See Western Md.)
Erie & Pittsburg R. R. (See Penna. Co.; (3) Div.)
Eureka Springs Ry. 4-8½ g. 19 m. 1 lo. 9 cars.
Powell Clayton, Gen. Man. Eureka Springs, Ark.
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 125 cars.
B. Gilman, Gen. Supt & Pur. Agt. Eureka, Nev.
J. M. Crawford, M. M..............Palisade, Nev.
A. S. Longley, M. C. B............Palisade, Nev.
European & North American R. R. (See Maine Cen.)
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, Supt.............Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 169 m. 26 lo. 973 c.
D. J. Mackey, Gen. Supt.......Evansville, Ind.
John Torrance, M. M...........Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 152 m. 100 lo. 3,430 cars.
John Adams, Gen. Supt..............Boston, Mass.
F. S. Pratt, Pur. Agt................Boston, Mass.
Supt. M. P...........Boston, Mass.
W. A. Foster, Asst. Supt. M. P...Fitchburg, Mass.
J. W. Marden, M. C. B.......Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 346 m. 72 lo. 2,100 cars.
H. C. Potter, Gen. Man.......E. Saginaw, Mich.
D. Edwards, Asst. Gen. Man..E. Saginaw, Mich.
G. G. Cook, Pur. Agt.........E. Saginaw, Mich.
Sanford Keeler, Gen. Supt..E. Saginaw, Mich.
W. F. Potter, Supt. (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, Supt. (W. Div.) E. Saginaw, Mich.
T. J. Hatswell, M. M.........E. Saginaw, Mich.
R. McPherson, M. C. B........E. Saginaw, Mich.
Florida Ry. & Nav. Co. 5 g. 488 m. 31 lo. 307 c.
D. E. Maxwell, Gen. Supt.....Fernandina, Fla.
R. V. Dohoney, M. M. & C. B. Fernandina, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 96 cars.
Sherman Conant, Gen. Man........Palatka, Fla.
Jas. D. Hollister, Supt..............Palatka, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 35 c.
Lawton Caten, Supt............Gloversville, N. Y.
G. V. Putman, M. M..........Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, Supt. & P. A. Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. (See Minn. & St. L.)
Franklin & Prov. & Hopkinton. 22 m.
E. T. Logee, Supt...................Milford, Mass.
Ft. Madison & No.-West'n Ry. 3 g. 45 m. 5 lo. 127 c.
S. B. Kenrick, Supt. & Pur. Agt. Ft. Madison, Ia.
I. L. Lamb, M. M. & C. B.......Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 128 m. 10 lo. 250 c.
White Water R. R. 4-8½ g. 65 m. 5 lo. 170 cars.
W. W. Worthington, Gen. Supt...Ft. Wayne, Ind.
T. H. Haberkorn, M. M..........Ft. Wayne, Ind.
Wm. Knight, M. C. B............Ft. Wayne, Ind.
Ft. Worth & Denver City Ry. 4-8½ g. 114 m. 8 lo. 443 c.
C. L. Frost, Gen. Supt.........Fort Worth, Tex.
Freehold & New York Ry. 4-8½ g. 15 m. 4 lo. 40 c.
J. E. Ralph, Supt. & Pur. Agt. Keyport, N. J.
M. C. Mooney, M. M...............Freehold, N. J.
C. H. Snedeker, M. C. B.........Freehold, N. J.
Fulton County N. G. Ry. 3 g. 61 m. 4 lo. 168 cars.
A. C. Atherton, Gen. Supt. & P. Agt. Lewiston, Ill.

G

Gainesville & Dahlonega R. R. 3 g. 15 m.
W. P. Price, Pres..................Dahlonega, Ga.
Gainesville, Jefferson & Southern R.R. (See Cen. of Ga.)
Gal., Harrisburg & San Antonio Ry. (See Cen. Pac.)
Galveston, Houston & Hend. R.R. (See Mo. Pac. (5) Div.)
Galveston, Sabine & St. Louis Ry.
4-8½ g. 15 m. 2 lo. 27 cars.
Brad. Barner, Gen. Man.........Longview, Tex.
Chas. H. Jewell, Gen. Supt.....Longview, Tex.
Geneva, Ithaca & Sayre R. R. (See Lehigh Val.)
George's Creek & Cumberland R. R.
4-9 g. 25 m. 6 lo. 212 cars.
J. A. Millholland, Gen. Man. Cumberland, Md.
Georgetown & Lane's R. R. 5 g. 36 m. 2 lo. 52 c.
G. W. Earle, Gen. Supt.......Georgetown, S. C.
Georgia R. R. 5 g. 307 m. 42 lo. 1,017 cars.
John W. Green, Gen. Man.........Augusta, Ga.
John S. Cook, M. M...................Augusta, Ga.
T. M. Preval, M. C. B................Augusta, Ga.
Georgia Pacific Ry. 5 g. 218 m.
I. Y. Sage, Gen. Supt.........Birmingham, Ala.
S. H. Purcell, Div. Supt.......Greenville, Miss.
G. H. Barnum, Div. Supt.......Columbus, Miss.
J. A. Branigan, M. M..........Greenville, Miss.
J. B. Shelton, M. C. B........Greenville, Miss.
Grand Haven R. R. (See Chic. & W. Mich.)
Grand Junction Ry. (See Midland of Can.)
Grand Rapids, Indiana & Mackinaw. (See Gr. R. & I.)
G'd Rap., Newaygo & L. S. R. R. (See Chic. & W. M.)
Grand Rapids & Indiana. 4-8½ g. 528 m. 52 lo. 1,724 c.
W. O. Hughart, Gen. Man. Grand Rapids, Mich.
W. R. Shelby, Pur. Agt....Grand Rapids, Mich.
S. D. Bradley, M. M........Grand Rapids, Mich.
No'n Div.: J. M. Metheany, Supt. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, Supt. Fort Wayne, Ind.
Grand Southern Ry. of New Brunswick.
4-8½ g. 82 m. 5 lo. 54 cars.
J. N. Greene, Gen. Man........St. George, N. B.
F. W. Holt, Supt................St. George, N. B.
Thomas Logan, M. M...........St. George, N. B.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, Supt. & P. A..Gr. Tower, Ill.
Hugh Smith, M. M. & C. B....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 2,332 m. 660 lo. 16,330 c.
Joseph Hickson, Gen. Man......Montreal, Can.
Jas. Stephenson, Supt.........Montreal, Can.
Wm. Wainright, Asst. Man......Montreal, Can.
Mont. Divs.: W. J. Spicer, Supt. Montreal, Can.
Jno. Taylor, Gen. Storekeeper. Montreal, Can.
Herbert Wallis, Mech. Supt...Montreal, Can.
Wm. McWood, Supt. Car Dept. Montreal, Can.
J. Haskoni, Div. M. S.........Richmond, P. Q.
Gt. West'n Div.: Chas. Stiff, Supt. Hamilton, Ont.
E. Baines, Store Kpr..............London, Ont.
C. K. Domville, Mech. Supt...Hamilton, Ont.
C. F. Hanson, Lo. For............London, Ont.
J. D. McIlwain, Supt. Car Dept..London, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 339 m. 103 lo. 1,191 c.
W. J. Spicer, Gen. Man..........Chicago, Ill.
W. H. Pettibone, Supt. ...Battle Creek, Mich.
A. Judd, Pur. Agt............Fort Gratiot, Mich.
H. Roberts, Mech. Supt....Port Huron, Mich.
Midland of Can. 4-8½ g. 471 m. 44 lo. 1,423 c.
W. B. Ferguson, Supt.........Peterboro, Ont.
J. D. Barnet, Mech. Supt.....Peterboro, Ont.
Grand Trunk, Georgian Bay & Lake Erie Ry. (See G. T.)
Great Western Ry. (See Grand Trunk; G. W. Div.)
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 623 cars.
Timothy Case, Gen. Man. & P. A. Green Bay, Wis.
A. Fenwick, M. M...............Ft. Howard, Wis.
Green Cove Spring & Melrose R.R. 3 g. 32 m. 1 lo. 11 c.
S. Ackley, Pres....................Philadelphia, Pa.
Greenwich & Johnsonville Ry. 4-8½ g. 15 m. 1 lo. 7 c..
J. H. Thompson, Supt.........Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 51 lo. 1,400 c.
Webster Snyder, Gen. Man...Galveston, Texas.
F. P. Killeen, Sec...............Galveston, Texas.
Jno. W. Thorne, Pur. Agt....Galveston, Texas.
W. H. Reilly, M. M. & M. C. B..Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 74 c.
M. D. Monserrate, Supt. & Pur. Agt. Cuero, Tex.
James Mooney, M. M..................Cuero, Texas.

H

Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,906 c.
J. F. Barnard, Gen. Man...........Chicago, Ill.
S. E. Crance, Gen. Supt..........Hannibal, Mo.
Wm. Irving, Pur. Agt...............Hannibal, Mo.
Jas. Long, Supt. M. P. & Car Dep. Hannibal, Mo.
Chas. Coller, For. Car Dept.......Hannibal, Mo.
Hanover Branch R. R. 4-8½ g. 8 m. 2 lo. 18 cars.
E. Y. Perry, Supt..........South Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 10 lo. 140 cars.
H. D. Scott, Gen. Supt..........Gettysburg, Pa.
John J. Bingley, M. M...............Hanover, Pa.
Jas. Harthorn, M. C. B..............Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 35 c.
R. H. Middleton, Supt.......Bolling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 47 m. 9 lo. 196 c.
O. M. Shepard, Asst. Supt.....New Haven, Ct.
John Henry, Jr., M. M...........Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 lo. 495 c.
John F. Jones, Supt..................Hartford, Ct.
J. C. Barton, M. M....................Hartford, Ct.
Hartwell R. R. (See Rich. & Dan.; N. G. Brs.)
Hecla & Torch Lake R. R. 4-1 g. 5 m. 5 lo. 165 cars.
W. A. Childs, Gen. Man............Calumet, Mich.
Herkimer, Newport & Poland Ry.
3-6 g. 17 m. 2 lo. 24 cars.
Albert Wilber, Supt............Herkimer, N. Y.
Hobart & Manistee River R. R. 3 g. 9 m. 2 lo. 42 c.
H. W. Marsh, Supt..................Hobart, Mich.
Hot Springs R. R. 3 g. 25 m. 3 lo. 37 cars.
J. N. Conger, Supt..............Hot Springs, Ark.
L. Finlay, M. M......................Malvern, Ark.
Housatonic R. R. 4-8½ g. 126 m. 25 lo. 571 cars.
W. H. Yeomans, Supt............Bridgeport, Ct.
D. S. Draper, Pur. Agt...........Bridgeport, Ct.
N. Slingland, M. M.............Falls Village, Ct.
J. J. Ferris, M. C. B............Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 16 miles.
S. L. Werden, V. P. & Gen. Man. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 150 m. 10 lo. 570 c.
Paul Bremond, Pr. & Pur. Agt. Houston, Tex.
E. L. Bremond, Gen. Man..........Houston, Tex.
B. O. Diffey, M. M....................Houston, Tex.
C. F. Schelewa, M. C. B............Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
J. Waldo, V. Pr. & Gen. Man....Houston, Tex.
A. H. Swanson, Gen. Tr. Man....Houston, Tex.
Pur. Agt..........New York, N. Y.
L. C. Noble, Gen. M. M..........Houston, Tex.
James McGee, M. C. B..............Houston, Tex.
So. & Wn. Divs.: M. G. Howe, Supt. Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, Supt., and
C. H. Burns, Asst. M. M.......Corsicana, Tex.
No.-Wn. Div.: Donald Allen, Supt.....Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 113 m. 18 lo. 80 cars.
F. O. Wyatt, Gen. Man.............Clarinda, Ia.
C. H. Warren, Supt.................Clarinda, Ia.
W. B. Snyder, M. M..............Shenandoah, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, Gen. Man.......Huntingdon, Pa.
Samuel B. Knight, Pur. Agt..Philadelphia, Pa.
William Barkla, M. M...............Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,928 m. 334 lo. 8,565 c.
E. T. Jeffery, Gen. Supt.............Chicago, Ill.
O. Ott, Pur. Agt......................Chicago, Ill.
Henry Schlacks, Supt. of Mach....Chicago, Ill.
W. B. Snow, M. M. Car Works.....Chicago, Ill.
(1) Ill. & Ia. Divs.: C. A. Beck, Supt.....Chicago, Ill.
Chic. Div.: T. J. Hudson, Supt..........Cairo, Ill.
Wm. Renshaw, M. M...............Chicago, Ill.
Mid. Div.: H. L. Frisbie, Supt.........Pontiac, Ill.
Spring. Div.: W. Wilkinson, Supt. Springfield, Ill.
W. B. McKenna, M. M...............Clinton, Ill.
No'n Div.: J. C. Jacobs, Supt...........Amboy, Ill.
J. B. Edams, M. M.....................Amboy, Ill.
Ia. Div.: M. Gilleas, Supt..............Dubuque, Ia.
Thos. W. Place, M. M...............Waterloo, Ia.
(2) So. Divs.: C. M. Sheafe, Supt....New Orleans, La.
Geo. W. Baxter, M. C. B...McComb City, Miss.
So. Div.: J. M. Turner, Supt. do.
E. D. Anderson, M. M....McComb City, Miss.
Miss. Div.: J. G. Mann, Supt......Jackson, Tenn.
J. F. White, M. M.............Water Valley, Miss.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, Rec. & Gen. Man......Decatur, Ill.
O. E. Grady, Train Mast.............Decatur, Ill.
Frank Young, For. Shops................Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 19 m. 10 lo. 450 c.
C. H. Sharman, Gen. Supt. & P. A. St. Louis, Mo.
D. J. Timlin, M. M..................Belleville, Ill.
Charles Rothe, M. C. B..........E. St. Louis, Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 826 m. 112 lo. 4,067 cars.
C. E. Henderson, Gen. Man. Indianapolis, Ind.
I. H. Wilson, Gen. Supt.....Indianapolis, Ind.
H. C. Norton, Pur. Agt......Indianapolis, Ind.
Jos. S. Porter, M. M...................Sandusky, O.
B. Warren, Gen. M. M.........Indianapolis, Ind.
Peoria Div.: E. Hiserodt, M. M.....Urbana, Ill.
St. Louis Div.: John King, M. M. Indianapolis, Ind.
Ohio So. Rd.: W. H. Van Tassall, S. Springfield, O.
A. J. Sanborn, M. M.................Springfield, O.
Indiana, Illinois & Iowa R.R. 4-8½ g. 104 m. 5 lo. 83 c.
F. M. Drake, Gen. Man.............Kankakee, Ill.
T. P. Shonts, Gen. Supt..........Kankakee, Ill.
R. C. Ackley, M. M..................Kankakee, Ill.
Indiana & Illinois Southern Ry. 3 g. 91 m. 3 lo. 69 c.
W. C. Lyon, Gen. Man. & P. Agt. Robinson, Ill.
J. S. Pickering, M. M. & C. B...Effingham, Ill.
Indianapolis, Decatur & Springfield Ry.
(See Ind., Bloom. & West'n.)
Indianapolis & St. Louis R. R. (See C., C., C. & I.)
Indianapo. & Vincennes R. R. (See Penna. Co.; (8) Div.)
Intercolonial Ry. 4-8½ g. 846 m. 135 lo. 4,500 cars.
David Pottinger, Chief Supt.....Moncton, N. B.
T. V. Cook, Gen. Storekeeper...Moncton, N. B.
H. A. Whitney, Mech. Supt......Moncton, N. B.
Ewd. D. Shaffer, M. C. B........Moncton, N. B.
M. & C. Div.: J. E. Price, Supt. Cambellton, N. B.
Hal. & St. J. Div.: J. J. Wallace, Supt. Truro, N. F.
Q. & St. F. Div.: A. McDonald, Supt. Riv. du Loup, Q.
International Ry. 4-8½ g. 69 m. 7 lo. 12 cars.
D. E. McFee, Supt...............Sherbrooke, Que.
J. Ruelle, M. M....................Sherbrooke, Que.
W. Charest, M. C. B...............Sherbrooke, Que.
International & Gt. N'n R. R. (See Mo. Pac.; (5) Div.)
Iowa Falls & Sioux City R. R. (See Ill. Cen.)
Iron Ry. (See Tol., Cin. & St. L.)
Iron Mountain & Helena R. R. (See Mo. Pac.; (4) Div.)
Ithaca Auburn & Western Ry. (See Southern Cen.)

J

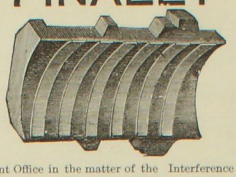
Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 60 c.
E. S. Greenleaf, Supt............Jacksonville, Ill.
Ira F. Petrie, M. M...............Jacksonville, Ill.
Jacksonville, St. Augustine & Halifax River Ry.
3 g. 76 m. 3 lo. 27 cars.
W. L. Crawford, Gen. Man...Jacksonville, Fla.
H. S. Ming, Supt..................Jacksonville, Fla.
Jacksonv., Pensacola & Mob. (See Fla. Cent. & W.)
Jamesville & Washington R. R. (See Norfolk So'n.)
Jeffersonv'l, Madison & Indpls. R. R. (See (9) Pa. Co.)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, Manager.....Jersey City, N. J.
Jersey City & Bergen R. R. 4-8½ g. 6 m. 2 lo. 13 c.
T. M. Sayre, Gen. Supt.........Jersey City, N. J.
Jersey Shore, Pine Creek & Buff. Ry. (See Phil. & R.)
Junction & Breakwater R.R. (See Del., Md. & Va.

K

Kaaterskill R. R. 3 g. 8 m.
J. H. Jones, Supt...................Rondout, N. Y.
Kankakee & Seneca R.R. (See Cin., Ind., St. L. & Chi.)
Kansas Central R. R. (See Union Pacific.)
Kansas City, Fort Scott & Gulf R. R.
4-8½ g. 389 m. 75 l. 2,037 c.
Geo. H. Nettleton, Gen. Man..Kansas City, Mo.
L. W. Towne, Supt..............Kansas City, Mo.
H. P. Jacques, Pur. Agt.......Kansas City, Mo.
J. S. McCrum, M. M.............Kansas City, Mo.
A. N. Montier, M. C. B.........Kansas City, Mo.
Kansas Cy, Lawrence & So Kan. (See At., Top. & S. F.)
Kansas City, Springfield & Memphis R. R.
4-8½ g. 283 m. 10 lo. 456 cars.
George H. Nettleton, Pres....Kansas City, Mo.
L. W. Towne, Supt..............Kansas City, Mo.
H. P. Jacques, Pur. Agt.......Kansas City, Mo.
J. S. McCrum, M. M.............Kansas City, Mo.
A. H. Montier, M. C. B.........Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ & 3 g. 368 m. 41 lo. 1,148 c.
J. F. Barnard, Gen. Supt.........St. Joseph, Mo.
J. R. Hardy, Supt..................St. Joseph, Mo.
Wm. Irving, Pur. Agt..............Chicago, Ill.
F. A. Chase, M. M..................St. Joseph, Mo.
Thos. Aylesbury, G. For. Car. Dep. St. Joseph, Mo.
Kansas City & Southern Ry. 4-8½ g. In progress.
Wm. Bailey, Pres.................Kansas City, Mo.
Kansas Coal Belt R. R. 4-8½ g. In progress.
C. H. Malin, Gen. Man...............Girard, Kan.
F. A. Hill, Supt.........................Girard, Kan.
Kansas & Gulf Short Line R. R. 33 m. 2 lo. 32 cars.
Eli Culverhouse, Gen. Man..........Tyler, Tex.
V. K. Stevenson, Pur. Agt.....New York, N. Y.
Kendall & Eldred R. R. (See Buf., N. Y. & Phil.)
Kent Northern Ry. 4-8½ g. 27 m. 2 lo. 16 cars.
J. C. Brown, Gen. Man.......Richibucto, N. B.
Kentucky Central R. R. 4-9 g. 184 m. 22 lo. 640 cars.
G. W. Bender, Supt................Covington, Ky.
A. H. Watts, M. of Mach.........Covington, Ky.
M. C. B..............Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, Supt. & P. A..Mt. Sterling, Ky.
S. P. Hatfield, M. M.............Mt. Sterling, Ky.
Keokuk & Des Moines R.R. (See Chi., R. I. & Pac.)
Kinzua R. R. (See Buf., N. Y. & Phil.)
Kingston & Pembroke Ry. 4-8½ g. 90 m. 9 lo. 214 c.
B. W. Folger, Supt..................Kingston, Ont.
J. H. Taylor, Pur. Agt............Kingston, Ont.
J. H. Taylor, M. M.................Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 103 cars.
C. A. Coombs, Supt.......................Bath, Me.
Wm. A. Field, M. M......................Bath, Me.
C. L. Turner, M. C. B......................Bath, Me.
Knoxville & Augusta R. R. 5 g. 16 m. 2 lo. 34 cars.
R. N. Hood, Gen. Man. & P. Agt. Knoxville, Tenn.
J. M. Hood, Supt...................Knoxville, Tenn.

L

Lackawanna & Pittsburg R. R. 3 g. 101 m.
R. M. Patterson, Gen. Supt...Friendship, N. Y.
Lake Champlain & Moriah R.R. 4-8½ g. 8 m. 8 lo. 222c.
E. B. Hedding, Supt............Port Henry, N. Y.
Lake Erie & Western Ry. 4-8½ g. 388 m. 53 lo. 1,701 c.
J. H. Cheney, Gen. Man.......Bloomington, Ill.
D. S. Hill, Gen. Supt...........Bloomington, Ill.
T. H. Perry, Pur. Agt...........Bloomington, Ill.
H. L. Cooper, Supt. of Equipment....Lima, O.
Lake George & Muskegon River R. R.
4-8½ g. 20 m. 4 lo. 79 cars.

FINALLY LE ROY  VICTORIOUS.

It is falsely pretended that our invention infringes an alleged patent held by Mr. Hopkins. We hereby offer **$2,500** *to Mr. Hopkins if he will commence and prosecute in good faith an action against us to settle the point; and, as we believe he has no valid patent, we stand ready to manufacture and sell his brasses in order that he may sue us. See Babbitt Patent, Sept. 4, 1840, and Joseph Gordnan, March 12, 1861. GEORGE W. McLEAN, President.*

The following is the FINAL decision of the Patent Office in the matter of the Interference of HOPKINS vs. LE ROY, renuered August 31, 1883

"COPY."

Department of the Interior, United States Patent Office
Washington, D. C., Sept. 1, 1883.

'In the matter of the interference of HOPKINS vs. LE ROY. On Appeal to the Commissioner.

'For a Journal Box composed of Hard and Soft Metal, the SOFT METAL BANDS PROJECTING ON THE JOURNAL BEARING SIDE BEYOND THE SURFACE OF THE HARD METAL, Priority of Invention Must be Awarded to LE ROY."

By direction of the Commissioner.

Very respectfully,

(Signed) SCHUYLER DINGEE, Chief Clerk.

To T. V. LE ROY, Care John R. Bennett, No. 237 Broadway.
George Harding, Counsel.

Thus reversing all former decisions made in favor of HOPKINS, dissolving the interference heretofore declared in his favor, and sustaining the validity of the LE ROY Patent and every claim made by LE ROY for his Invention.

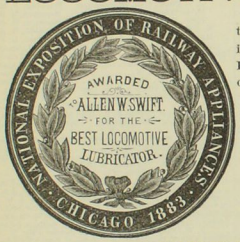
LE ROY JOURNAL BEARING CO.,

145 Broadway, New York City. GEO. W. McLEAN, President.

THE "SWIFT" AUTOMATIC LUBRICATOR.

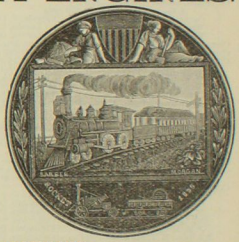
A PERFECT MACHINE FOR THE INTERNAL LUBRICATION OF THE

LOCOMOTIVE, MARINE & STATIONARY ENGINES.



This device delivers any desired quan tity to each cylinder POSITIVELY, and its feed-rate remains unchanged with the Engine at FULL STROKE, THROTTLED or REVERSED.

Will feed any ordinary Lubricant fro the lightest oils to the HARDEST TALLOW IN THE COLDEST WEATHER.



Positive Feed Flash "Sight."

NO EXTERNAL OR INTERNAL PIPES.

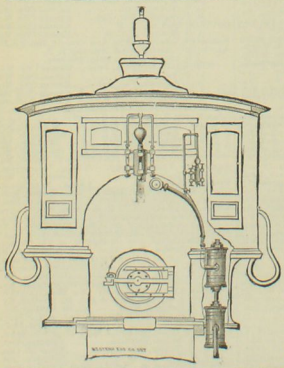
NO GLASS TUBES OR LOOSE JOINTS.

Approved by the Eastern and Western R. R. Association.

NOW IN USE ON THE LEADING RAILROADS IN THE COUNTRY, INCLUDING
Pennsylvania R. R., Union Pacific R. R., New York, West Shore & Buffalo, Chicago & Alton, Lehigh Valley, Delaware, Lackawanna & Western R. R.

CORRESPONDENCE SOLICITED.

"SWIFT" LUBRICATOR COMPANY, ELMIRA, N. Y.



THE DETROIT LUBRICATOR COMPANY'S

SIGHT FEED LUBRICATORS,

For Locomotive Cylinders and Air-Pumps.

The attention of railroad men is invited to the Detroit Lubricator Co.'s Patent Sight Feed Lubricators, for oiling locomotive valves and cylinders, and the Westinghouse Air Pump. Both cups are placed within the cab. The valve cup has a double sight feed, each of which is connected to the right and left hand steam chests, by means of the so-called "tallow pipes," running beneath the jacket, thus securing *independent lubrication to each steam chest and cylinder from the one cup.* The oil is shown passing in drops through each sight feed glass to the parts to be lubricated, and can be regulated to feed fast or slow. *The feed is regular and continuous, owing up or down grade, whether pressure is on or off*, thus securing perfect lubrication at all times. What is said in reference to the valve cup, is equally true in regard to our lubricator for the Westinghouse Pump. By the use of these cups, the saving in wear and tear of machinery and the additional power gained is simply wonderful, as is proved by actual results.*

We solicit a practical test, and will send one or more valve and air-brake cups to responsible parties on 30 days' trial. Details and drawings showing manner of attachment and prices furnished on application.

DETROIT LUBRICATOR CO.

Office: 129 GRISWOLD ST., - - - DETROIT, MICH.

* Numerous examples can be furnished where engines have run *two years and over, without having had their valves faced.* The average mileage for the air-brake lubricator is 500 to 1,500 miles to the ¼ pint, and examples can be given where this mileage has been greatly exceeded, among which is one of *1,012 miles with a ¼ pint* of oil on a daily run of 308 miles with 64 stops. This pump has run *nine months without having had 25 cents expended on it for repairs.*

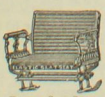
HALE & KILBURN MANUFACTURING COMP'Y,

48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,

EXTENSIVE MAKERS OF

PATENTED CAR SEATS AND SPRINGS.

REFERENCES.
N. Y. C. & H. R. R. CO.
N. Y. ELEVATED R. R.
ILL. CENTRAL R. R.
PULLMAN P. C. CO.
PENN. R. R. CO.
N. Y. & N. ENG'D R. R.
BALT. & O. R. R.
AND ONE HUNDRED OTHERS.


Elastic Slat Seat.


Rattan Spring Seat.


Spring Edge Seat.

ESTIMATES, CIRCULARS AND SAMPLES FURNISHED ON APPLICATION.


Parlor Car Chair

W. S. Gerrish, *Gen. Man*....Muskegon, Mich.
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,340 m. 547 lo. 17,115 cars.
John Newell, *Gen. Man*....Cleveland, O.
P. P. Wright, *Gen. Supt*....Cleveland, O
L. G. Higgins, *Pur. Agt*....Cleveland, O.
G. W. Stevens, *Supt. M. P*....Cleveland, O.
John Kirby, *Gen. M. C. B*....Cleveland, O.
East'n Div.: C. B. Couch, *Supt*....Cleveland, O.
J. S. Graham, *M. M*....Buffalo, N. Y.
A. C. Robson, *M. C. B*....Buffalo, N. Y.
L. O. Gassett, *M. M*....Cleveland, O.
J. Withycombe, *M. C. B*....Cleveland, O.
Frank. Div.: G. H. McIntire, *Supt.* Youngstown, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.* Cleveland, O.
J. M. Sanborn, *M. M*....Norwalk, O.
W. O. Smith, *M. C. B*....Norwalk, O.
Mich. Divs.: J. E. Curtis, *Supt*....Toledo, O.
Det. Brs.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing, Ypsilanti & Ft. Wayne Branches.
W. H. Caniff, *Supt*....Hillsdale, Mich.
Western Div.: A. G. Amsden, *Supt*...Chicago, Ill.
W. L. Gilmore, *M. M*....Elkhart, Ind.
Frank O. Bray, *M. C. B*....Adrian, Mich.
Gr. Rap. Br.: M. E. Wattles, *Supt.* Kalamazoo, Mich.
Lake Tahoe R. R. 3 g. 10 m. 3 lo. 49 cars.
D. L. Bliss, *Gen. Man*....Carson, Nev.
John T. Rogers, *Gen. Supt*....Carson, Nev.
Geo. R. Lindsay, *M. M*....Carson, Nev.
Leavenworth, Topeka & So. W'n Ry. (*See A. T. & S. F.*)
Lebanon Springs R. R. 4-8½ g. 58 m. 5 lo. 44 c.
W. C. Alstyne, *Gen. Man*....Albany, N. Y.
W. H. Hawkins, *Pur. Agt*....Albany, N. Y.
Geo. Tefft, *M. M*....Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 495 m. 392 lo. 36,998 c.
H. S. Goodwin, *Gen. Supt*....Bethlehem, Pa.
W. C. Alderson, *Pur. Agt*....Philadelphia, Pa.
John I. Kinsey, *M. M*....So. Easton, Pa.
John S. Lentz, *M. C. B*....Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt.* Perth Amboy, N. J.
Coal Rds.: J. I. Blakeslee, *Supt.* Mauch Chunk, Pa.
D. Clark, *M. M*....Hazleton, Pa.
John Campbell, *M. M*....Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.*..Mauch Chunk, Pa.
P. Hofecker, *M. M*....Weatherly, Pa.
Wy. Div.: A. Mitchell, *S. & M. M.* Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Gen. Supt*....Sayre, Pa.
J. N. Weaver, *M. M*....Sayre, Pa.
Lehigh & Hudson River Ry. 4-8½ g. 63 m. 8 lo. 350 c.
Grinnell Burt, *Gen Man*....Warwick, N. Y.
N. L. Furman, *Supt*....Warwick, N. Y.
John Sayre, *Pur. Agt*....Warwick, N. Y.
N. L. Furman, *Supt*....Warwick, N. Y.
S. Mills, *M. M*....Warwick, N. Y.
Lehigh & Lackawanna and Lehigh & Susquehanna R. Rs. (*See Phil. & Read.; N. J. Cen. Div.*)
Levis & Kennebec R. R. (*See Quebec Cen.*)
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*....Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt*....Latrobe, Pa.
Little Miami R. R. (*See Penna. Co.'s Rds; (8) Div.*)
Little Rock, Miss. River & Texas Ry.
4-8½ g. 170 m. 12 lo. 299 cars.
H. Wood, *Gen Man*....Little Rock, Ark.
F. A. Lister, *Gen. Supt*....Little Rock, Ark.
F. Hufsmith, *M. M. & C. B.*..Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 170 m. 13 lo. 360 c
Hy. Wood, *Gen. Man*....Little Rock, Ark.
F. A. Lister, *Gen. Supt*....Little Rock, Ark.
F. Hufsmith, *M. M. & M. C. B*....Argenta, Ark.
Little Saw Mill Run R. R. 3 & 4-8½ g. 8 m. 4 lo. 327 c.
T. Hartley, *Gen. Man*....Banksville, Pa.
Long Island R. R. 4-8½ g. 352 m. 92 lo. 953 cars.
I. D. Barton, *Gen. Supt.*..Long Island City, N. Y
Benj. Norton, *Pur. Agt.*..Long Island City, N. Y.
C. A. Thompson, *M. M.* Long Island City, N. Y.
Longview & Sabine Valley R. R. (*See Gal. Sab. & St. L.*)
Louisiana W'n R. R. (*See Cen. Pac.; G., H. & S. A. Div.*)
Louisville, Cin. & Lexington R. R. (*See Louis. & N.*)
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Geo. T. Evans, *Gen. Man*....Louisville, Ky.
C. F. Dalton, *Gen. Supt*....Louisville, Ky.
F. P. Boatman, *M. M*....Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John B. Carson, *Gen. Supt*....Louisville, Ky.
T. L. Dunn, *Gen. Supt*....Chicago, Ill.
H. O. Nourse, *Pur. Agt*....Louisville, Ky
Josiah Bettis, *M. M. & C. B*...New Albany, Ind.
C. C. F. Bent, *Supt. Trans*....Lafayette, Ind.
Louisville, New Orleans & Tex. Ry. 450 m. In progress.
R. T. Wilson, *Dir.* 2 Exchange Ct., New York.
Louisville & Nashville R. R.
5 g. 2,186 m. 380 lo. 12,197 cars.
J. T. Harahan, *Gen. Man*....Louisville, Ky.
W. P. Harris, *Supt*....Louisville, Ky.
P. P. Huston, *Pur. Agt*....Louisville, Ky.
Reuben Wells, *Supt. Mach*....Louisville, Ky.
Louisv., Cin. & Lex. Divs.:
J. G. Metcalf, *Supt. Trans*....Louisville, Ky.
P. Leeds, *M. M*....Louisville, Ky.
J. W. Luttrell, *M. M*....Louisville, Ky.
J. G. Clifford, *M. M.* (2d & C. Div.) Bowling Grn. Ky.
Henderson Div.: J. Geddes, *Supt.* Henderson, Ky.
W. P. Pike, *M. M*....Nashville, Tenn.
Nash. & D. Div.: J. Geddes, *Supt.* Nashville, Tenn.
S. & N. A. Div.: *Supt*...Birmingham, Ala.
C. W. White, *M. M*....Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*....Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: O. M. Dunn, *Supt*....New Orleans, La.
Wm. Adair, *M. M*....Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt.* Memphis, Tenn.
J. V. Slusser, *M. M*....Memphis, Tenn.
St. L. Div.: C. O. Parker, *Supt.* Montgomery, Ala.
Thos. Walsh, *M. M*....Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, *Supt*....Pensacola, Fla.
W. D. Robb, *M. M*....Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m. 1 lo. 5 c.
J. H. Wilkins, *Supt. & Pur. Agt.* Louisville, Ga.

M

Macon & Brunswick R. R.
(*See E. Tenn., Vir. & Ga.; At. & Ga. Divs.*)
Maine Central R. R. 4-8½ g. 465 m. 59 lo. 1,335 c.
Payson Tucker, *Gen. Man*....Portland, Me.
Ira K. Russell, *M. M*....Waterville, Me.
C. H. Kenison, *M. C. B*....Augusta, Me.
Eastern Maine. 3 g. 19 m. 2 lo. 40 c.
L. L. Lincoln, *Supt*....Portland, Me.
Manchester & Keene R. R. 4-8½ g. 30 m. (*See Concord.*)
Manchester & Lawrence R. R. (*See Concord.*)
Manchester & North Weare R. R. (*See Concord.*)
Manhattan Ry. 4-8½ g. 32 m. 228 lo. 652 pass. c.
Frank K. Hain, *Gen. Man*....New York, N. Y.
W. T. Goundie, *Supt. Trans.*..New York, N. Y.
T. W. Peeples, *M. M*....New York, N. Y.
H. A. Webster, *M. C. B*....New York, N. Y.
Manhattan, Alma & Burlingame Ry. (*See A., T. & S. F.*)
Manitoba Southwestern Colonization Ry.
4-8½ g. 52 m. 3 lo. 125 cars.
J. M. Eagan, *Gen. Supt*....Winnipeg, Man.
Chas. Newell, *M. M*....Winnipeg, Man.
Marietta & Cincinnati R. R. (*See Cin. Wash. & Balt.*)
Marietta & North Georgia R. R. 3 g. 60 m. 3 lo. 7 c.
J. B. Glover, *Supt. & P. Agt*....Marietta, Ga.
E. A. Withers, *M. M*....Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 100 m. 42 lo. 2,530 cars.
Samuel Schoch, *Gen. Man*....Marquette, Mich.
M. B. McGee, *Pur. Agt*....Marquette, Mich.
W. A. Thompson, *M. M*....Marquette, Mich.
H. D. Lyons, *M. C. B*....Marquette, Mich.
Maryland Central R. R. 3 g. 27 m. 4 lo. 56 cars.
S. G. Boyd, *Supt*....Baltimore, Md.
Marquette & Western.
D. McCool, *Gen. Supt*....Marquette, Mich.
W. J. Tench, *Pur. Agt*....Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m. 5 l. 81 c.
E. G. Allen, *Supt. & Pur. Agt*....Boston, Mass.
E. A. Walker, *M. M*....So. Sudbury, Mass.
McComb, Deshler & Toledo R. R.
(*See Cin., Ham. & Day.; D. & M. Div*
Meadville Ry. (*See Penna. Co.'s Rds.; (2) Div.*)
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*.
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 299 c.
R. Fink, *G. Man. & P. A*....Little Rock, Ark.
H. G. Fleming, *Supt*....Memphis, Tenn.

Thos. Rennell, *M. M*....Argenta, Ark.
T. Rennell, *M. C. B*....Argenta, Ark.
Mexican Ry. 4-8½ g. 293 m. 42 lo. 616 cars.
E. W. Jackson, *Gen. Man*....Mexico, Mex.
Mexican Central Ry. 4-8½ g. 680 m. 73 lo. 818 c.
Theo. Nickerson, *Pur. Agt*....Boston, Mass.
D. B. Robinson, *Gen. Man*....City of Mexico.
D. MacKenzie, *Gen. Supt*....City of Mexico.
J. H. O'Brien, *M. M*....City of Mexico.
G. T. Jarvis, *Div. Supt*....City of Mexico.
J. H. Smith, *Div. Supt*....Silao, Mex.
Wm. Davis, *Div. Supt*....Jimulco, Mex.
E. E. Comfort, *Div. Supt.*..Paso del Norte, Mex.
F. W. Johnstone, *Supt. R. S*....City of Mexico.
E. P. Simpson, *M. M*....City of Mexico.
A. Hendee, *M. M*....Calera, Mex.
C. F. Stewart, *M. M*....Silao, Mex.
W. L. Wallace, *M. M*....Jimulco, Mex.
J. G. McCuen, *M. M*....Chihuahua, Mex.
San Blas Div.: C. E. Payne, *Supt.*..San Blas, Mex.
1st Div.: G. T. Jarvis, *Supt*....City of Mexico.
2d Div.: J. H. Smith, *Supt*....Silas, Mex.
3d Div.: Wm. Davis, *Supt*....Jimulco, Mex.
4th Div.: R. E. Comfort, *Supt.* Paso Del Norte, Mex.
Mexican National Ry. 3 g. 766 m. 50 lo. 1,283 c.
Texas Mexican Ry. 3 g. 171 m. 10 lo. 212 c.
R. C. Peebles, *Supt*....Mexico, Mex.
W. F. Baldwin, *Asst. Supt*....Laredo, Tex.
Galv. Div. T. M. Ry.: M. Quin, *Supt.* Galveston, Tex.
No. Div. Mex. Nat. Ry. & So. Div. Tex.-Mex. Ry.
C. A. Merriam, *Supt*....Laredo, Texas.
Tho. Milan, *M. M*....Corpus Christi, Tex.
So. Div. M. N. Ry.: W. E. Lewis, *Supt.* Mexico, Mex.
J. M. Winslow, *M. M*....Mexico, Mex.
Mat. Div.: F. E. Butterfield, *Supt.* Matamoras, Mex.
Mexican, Oriental, Inter-Oceanic & International R. R. 1,400 miles. In progress.
G. M. Dodge, *Pres.* 195 B'way, New York, N. Y.
Michigan Cen. R. R. 4-8½ g. 1,485 m. 357 lo. 11,284 c.
H. B. Ledyard, *Pres. & Gen. Man.* Detroit, Mich.
E. C. Brown, *Gen. Supt*....Detroit, Mich.
Robert Miller, *Asst. Gen. Supt*...Detroit, Mich.
Allan Bourn, *Pur. Agt*....Detroit, Mich.
S. H. Edgerly, *Gen. M. M*....Jackson, Mich.
(1) Lines West of Detroit River:
E. C. Brown, *Gen. Supt*....Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt.* Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*....Bay City, Mich.
C. E. Smart, *M. M*....Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*....Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt.* Chicago, Ill.
(2) Lines East of Detroit River:
Wm. H. Perry, *Agt*....Buffalo, N. Y.
J. E. Morford, *Supt*....St. Thomas, Ont.
A. Bull, *M. M*....St. Thomas, Ont.
Rob't Potts, *M. C. B*....St. Thomas, Ont.
Michigan & Ohio.
Luther Allen, *Supt*....Toledo, O.
H. H. Mitchell, *Pur. Agt*....Toledo, O.
D. J. Durrell, *M. M*....Marshall, Mich.
Middleburg & Schoharie; and Schoharie Valley R. Rs. 4-8½ g. 11 m. 2 lo. 6 cars.
P. S. Danforth, *Gen. Supt*...Middleburg, N. Y.
Midland of Canada. (*See Grand Trunk.*)
Midland No. Carolina Ry. 5 g. 95 m. 9 lo. 82 cars.
Atlantic & North Carolina Ry. 22 m.
John D. Whitford, *Gen. Man*..Newbern, N. C.
J. A. Bryan, *Supt*....Newbern, N. C
D. J. Sprague, *Pur. Agt*....New York, N. Y.
B. Manly, *Supt. of Mach*....Newbern, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 370 m. 45 lo. 1,536 cars.
H. G. H. Reed, *Gen. Man. & P. Agt.* Milwaukee, Wis
J. Donahue, *Supt*....Milwaukee, Wis.
David B. Curtis, *Asst. Supt*....Oshkosh, Wis
John Hickey, *M. M*....Ledyard, Wis.
Milwaukee & Northern and Wisconsin & Michigan R. Rds. 4-8½ g. 228 m. 24 l. 703 cars
C. F. Dutton, *Gen. Supt*....Milwaukee, Wis.
N. S. Kimball, *M. M*....Ft. Howard, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 43 cars
Chas. E. Holland, *Pr. & Supt*...Hancock, Mich.
W. H. Carr, *Pur. Agt*....Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B*..Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 miles 4 motors 1 lo. 35 cars.
William McCrory, *Man*....Minneapolis, Minn.
T. W. Heintzelman, *M. M*..Minneapolis, Minn.
Mississippi, Terre Aux Boeufs & Lake R. R.
29 miles.
M. R. Spelman, *Supt*....New Orleans, La.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 12 lo. 194 c,
M. Burke, *Gen. Supt*....Memphis, Tenn.
J. C. Ramsey, *M. M*....Memphis, Tenn.
S. J. Bolton, *M. C. B*....Memphis, Tenn.
Missouri, Kansas & Texas Ry. (*See Mo. Pac.; (2) Div.*)
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 6,029 m. 697 lo. 19,748 cars.
H. M. Hoxie, *3d V. Pres*....St. Louis, Mo.
R. B. Lyle, *Pur. Agt*....St. Louis, Mo.
(1), (2) and (3) Divs.:
John Hewitt, *Supt. M. P. & M.*..St. Louis, Mo.
John Hodge, *Supt. Car Dep*....St. Louis, Mo.
Frank Howard, *Asst. Supt. C. D.*..Marshall, Tex.
(4), (5) and (6) Divs.:
O. A. Haynes, *S. M. P. & M*....Marshall, Tex.
(1) Missouri Pacific Ry. 1,028 m. 155 lo. 4,218 cars.
A. M. Hager, *Supt*....Sedalia, Mo.
E. Taylor, *M. M*....Sedalia, Mo.
W'n Div.: W. W. Fagan, *Supt*....Atchison, Kan.
(2) Mo., Kan. & Tex. Ry. 1,308 m. 140 lo. 4,248 cars.
S. Irvin, *Asst. Supt. Car Dep*....Sedalia, Mo.
J. B. Vandyne, *Supt*....Parsons, Kan.
J. W. Haines, *M. M*....Parsons, Kan.
(3) Central Branch Un. Pac. R. R. 388 m. 30 lo. 599 c.
W. W. Fagan, *Supt*....Atchison, Kan.
H. V. Faries, *M. M*....Atchison, Kan.
J. W. Blackburn, *A. Supt. Car D.*..Atchison, Kan.
(4) St. L., I. Mt. & So'n Ry. 905 m. 138 lo. 4,928 c.
Wm. Kerrigan, *Supt*....St. Louis, Mo.
St. Louis Div.: W. H. Harris, *M. M.*..De Soto, Mo.
Ark. Div.: *Supt*....Little Rock, Ark.
R. M. Richardson, *M. M*....Little Rock, Ark.
(5) Int. & G. No.: John Herrin, *Supt*..Palestine, Tex.
W. S. Morris, *M. M*....Palestine, Tex.
(6) Tex. & Pac.: W. Cummings, *Supt.* Marshall, Tex.
E. N. O. & Tr. Cont. Divs.:
Geo. Dimick, *Supt*....Marshall, Tex.
E. A. Haggerty, *M. M*....Marshall, Tex.
E. R. Smith, *M. M. & M. C. B*..N. Orleans, La.
Rio Grande Div.:
L. L. Keller, *Supt*....Big Springs, Tex.
J. K. Lape, *M. M*....Big Springs, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*....Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars
W. L. Clark, *Gen. Supt*....Columbus, Ga.
J. C. Albrecht, *M. M*....Columbus, Ga.
A. J. Nix, *M. C. B*....Columbus, Ga.
Mobile & Montgomery Ry. (*See Louis. & Nash.*)
Mobile & Northwestern R. R. 3 g. 31 m. 2 lo. 16 c.
Thomas T. A. Lyon, *Pres*....Glendale, Miss.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
G. Jordan, *V.-Pr. & Gen. Man*....Mobile, Ala.
F. Jordan, *Pur. Agt*....Mobile, Ala.
M. T. Carson, *Gen. M. M*....Whistler, Ala.
J. T. Booth, *M. C. B*....Whistler, Ala.
So'n Div.: J. G. Motley, *Supt*....Mobile, Ala.
L. J. Morris, *M. M*....Macon, Miss.
No'n Div.: E. S. Hosford, *Supt*..Jackson, Tenn.
H. C. Goode, *M. M*....Jackson, Tenn.
Mobile & Spring Hill R. R. 5-2 g. 8 m. 1 lo. 16 cars.
F. Ingate, *Manager*....Mobile, Ala.
Moline & Southeastern R. R. 3-6 g. 8 m. 2 lo. 26 c.
R. Battersly, *Gen. Man*....Coal Valley, Ill.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 8 cars.
G. B. Wiestling, *Supt. & P. A*....Mont Alto, Pa.
Montgomery & Eufaula Ry. (*See Cen. of Ga.*)
Montgomery Southern Ry. 3 g. 20 m. 1 lo. 15 cars.
S. D. Hubbard, Jr., *Gen. Man.* Montgomery, Ala.
Montour R. R. 4-8½ g. 12 m. 2 lo. 130 cars.
C. R. Brown, *Supt. & Pur. Agt*..Imperial, Pa.
Henry Newman, *M. C. B*....Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 86 c.
W. A. Stowell, *Supt*....Montpelier, Vt.
Montreal, Portland & Boston Ry. (*See Passumpsic.*)
Montreal & Sorel Ry. 4-8½ g. 47 m. 3 lo. 35 c.
C. N. Armstrong, *G. M. & Pur. Agt.* Sorel, Que.

J. F. Armstrong, *Gen. Supt*....Sorel, Que.
G. W. Pangborn, *M. M*....Sorel, Que.
Montrose Ry. 3 g. 28 m. 3 lo. 24 cars.
T. G. Walter, *Gen. Supt*....Tunkhannock, Pa.
Morgan's Louis. & Tex. R. R. 4-8½ g. 242 m. 46 l. 1,339 c.
J. Kruttschnitt, *Supt*....New Orleans, La.
C. Trumpy, *Pur. Agt*....New Orleans, La.
J. D. Connell, *M. M*....Algiers, La.
Jno. Hildebrand, *M. C. B*....Algiers, La.
Mount Washington R. R. 5-3 g. 3 m. 6 lo. 6 cars.
Walter Aiken, *Gen. Man*....Franklin, N. H.
Muncy Creek Ry. (*See Wmspt. & No. Br.*)

N

Nantasket Beach R. R. 4-8½ g. 6 m. 5 lo. 25 c.
George L. Keyes, *Gen. Supt*....Boston, Mass.
Naugatuck R. R. 3 g. 4 m. 17 lo. 547 cars.
Geo. W. Beach, *Supt*....Waterbury, Conn.
H. A. Bishop, *Pur. Agt*....Bridgeport, Conn.
H'y D. Beach, *Supt. R. S*....Bridgeport, Conn.
Napanee, Tamworth & Quebec Ry. In progress.
Ed. W. Rathbun, *Man. Dir*....Deseronto, Ont
R. C. Carter, *Supt*....Deseronto, Ont.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 11 c.
G. T. Lanphear, *Supt. & Pur. Agt.* Peacedale, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis Ry.
5 g. 539 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Man. & P. Agt.* Nashville, Tenn.
M. J. C. Wrenne, *Supt*....Nashville, Tenn.
James Cullen, *M. M. & C. B*....Nashville, Tenn.
Nashville & Florence R. R. 5 g. 20 m.
J. T. Craik, *Supt*....Columbia, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 100 m. 7 lo. 92 c.
E. D. Frost, *Gen. Supt*....Natchez, Miss.
National Car Company. 4,000 freight cars.
L. Millis, *Pres*....Boston, Mass.
F. Stewart Stranahan, *Sec. & Tr.* St. Albans, Vt.
John B. Fletcher, *Supt*....St. Albans, Vt.
Nebraska, Topeka, Iola & Memphis R. R. 4-8½ g. 16 m.
H. M. Clarke, *Gen. Man*....Girard, Kan.
C. H. Malin, *Gen. Supt*....Girard, Kan.
Nevada Central R. R. (*See Union Pac.; (7) Div.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, *Supt*....Grass Valley, Cal.
Jas. McCormick, *M. M. & C. B.* Grass Valley, Cal.
Nevada & Oregon R. R. 3 g. 30 m. 25 cars.
D. W. Balch, *Supt*....Reno, Nev.
New Brunswick Ry. 4-8½ g. 419 m. 20 lo. 357 cars.
E. R. Burpee, *Gen. Man*....Woodstock, N. B.
Jesse Mathews, *M. M*....Gibson, N. B.
T. N. Burpee, *M. C. B*....McAdam Junc., N. B.
J. J. Seely, *Pur. Agt*....Woodstock, N. B.
Thos. Armstrong, *M. M*....St. Andrew's, N. B.
G. Houlton, *M. C. B*....St. Andrew's, N. B.
New Brunswick & Can. Ry. (*See New Brun.*)
New Castle R. R. 3-6 g. 5 m. 2 lo. 76 cars.
Geo. Pearson, *Gen. Man*....New Castle, Pa.
New Castle & Beaver Valley R. R. (*See Penna. Co.*)
New Haven & Derby R. R. 4-8½ g. 13 m. 4 lo. 70 c.
E. S. Quintard, *Supt*....New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.* New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 170 m. 27 lo. 598 c.
S. B. Opdyke, Jr., *Supt*....New Haven, Ct.
R. G. Curtis, *Pur. Agt*....New Haven, Ct.
Henry Fox, *M. M*....New Haven, Ct.
John Sweeny, *For Car. Shps*...New Haven, Ct.
New Jersey & New York Ry. 4-8½ g. 37 m. 6 lo. 40 c.
J. D. Hasbrouck, *Gen. Man*....Jersey City, N. J.
J. S. Drake, *Supt. & M. M*....Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B*....Hillsdale, N. J.
N. J. Southern Ry. (*See Phil. & Read.; N. J. So. Div.*)
New London Northern R. R. (*See Central Ver.*)
New Orleans, B. Rouge, Vicks. & Memphis.
Jas. M. Edwards, *Gen. Man*..New Orleans, La.
John Bradley, *Supt*....New Orleans, La.
New Orleans Pacific Ry. (*See Mo. Pac.; (6) Div.*)
New Orleans & Carrollton R. R.
4-8½ g. 15 m. 12 lo. 79 cars.
C. V. Haile, *Supt*....New Orleans, La.
John Dahmer, *M. M*....New Orleans, La.
Jas. Thorn, *M. C. B*....New Orleans, La.
New Orleans & Mobile R. R. (*See Louis. & Nash.*)
N. O. & Northeastern R. R. (*See Cin., N. O. & Tex. Pac.*)
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 8 cars.
L. B. Schofield, Supt....Selma, Ala.
N. Y. Central & Hudson River R. R.
4-8½ g. 983 m. 676 lo. 25,161 cars.
J. M. Toucey, *Gen. Supt*....New York, N. Y.
R. C. Moore, *Pur. Agt*....New York, N. Y.
Wm. Buchanan, *Supt. M. P*...New York, N. Y.
L. Garey, *Supt. Car Dept*....New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt.* do.
P. McQ. Gibson, *M. M*....New York, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt.* N. York, N. Y.
Peter Smith, *M. C. B*....New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*....Utica, N. Y.
John Ortton, *M. M*....West Albany, N. Y.
L. Packard, *M. C. B*....West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt.* Rochester, N. Y.
S. L. White, *M. M*....Syracuse, N. Y.
Amos Gould, *M. M*....E. Buffalo, N. Y.
E. Chamberlain, *M. C. B*....E. Buffalo, N. Y.
C. H. Burchard, *M. C. B*..E. Rochester, N. Y.
Rd. Donaby, *M. C. B*....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 513 m. 115 lo. 4,838 c.
Lewis Williams, *Gen. Man*....Cleveland, O.
Jno. Mackenzie, *Supt. M. P*....Cleveland, O.
Eas'tn Div.: G. H. Kimball, *Supt*....Cleveland, O.
E. A. Miller, *M. M*....Conneaut, O.
West'n Div.: A. H. Evans, *Supt*....Chicago, Ill.
Jas. Eckford, *M. M*....Bellevue, O.
New York City & Northern. 4-8½ g. 54 m. 17 lo. 368 c.
Frank S. Gannon, *Gen. Supt.* High Bridge, N. Y
Tho. Millen, *M. M*....High Bridge, N. Y.
New York, Lackawanna & W'n Ry. (*See Del. L. & W.*)
New York, Lake Erie & Western R. R.
E. S. Bowen, *V. Pr*....New York, N. Y.
(1) N. Y., L. E. & W. Div.: 4-8½ g. 1,073 m. 576 lo. 30,553 c.
B. Thomas, *Gen. Supt*....Jersey City, N. J.
J. A. Hardenburgh, *Pur. Agt.* New York, N. Y.
F. M. Wilder, *Supt. M. P. & M*...Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*....Jersey City, N. J.
J. H. Vreeland, *M. M*....Jersey City, N. J.
J. N. Mileham, *M. C. B*....Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt*..Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.* Pt. Jervis, N. Y.
Susq. Div.: J. Jolls, *Supt*....Elmira, N. Y.
V. Blackburn, *M. M*....Susquehanna, Pa.
D. B. Goodell, *M. C. B*....Elmira, N. Y.
Buf. & R. Divs.: Chas. Neilson, *Supt.*; and
G. B. Ross, *M. M*....Buffalo, N. Y.
M. Wilder, *M. C. B*....Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt.* do.
W'n Div.: W. B. Coffin, *Supt.*..Hornellsville, N. Y.
Geo. H. Griggs, *M. M*....Hornellsville, N. Y
N. Y. & Greenwood L. Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt*....Jersey City, N. J.
F. A. Stinard, *M. M*....Pompton, N. J
(2) N. Y., Pa & O. Div.: 4-8½ g. 565 m. 221 lo. 7,794 c
J. M. Ferris, *Gen. Supt*....Cleveland, Ohio.
J. H. Holway, *Pur. Agt*....Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B*...Cleveland, O.
S. V. Smith, *Asst. Gen. M. C. B*....Kent, Ohio.
E'n Div.: A. L. Dunbar, *Supt*....Meadville, Pa.
J. A. Cooper, *M. M*....Meadville, Pa.
D. S. Dockstader, *M. C. Rep*...Meadville, Pa
W'n Div.: T. A. Phillips, *Supt*....Galion, O.
Wm Hill, *M. M*....Galion, O.
J. W. Holmes, *For. Car Rep*....Galion, O.
Geo. Wilson, *For. Car Rep*....Dayton, Ohio.
Maho'g Div.: N. F. Wood, *Supt*....Cleveland, O.
N. Wright, *M. M*....Cleveland, O.
C. N. Thorp, *M. C. Rep*....Cleveland, O.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man*..New Haven, Ct.
R. N. Dowd, *Pur. Agt*....New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt*...N. Y.
Shore Line and Air Line Divs.:
O. M. Shepard, *Supt*....N. Haven, Ct.
John Henny, Jr., *Supt. M. P.*..New Haven, Ct.
Jas. Denver, *M. C. B*....New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt*....Hartford, Ct.
Supt. M. P. & M. C. B.... do.
N. Y., Ontario & Western Ry. (*See N. Y., W. Sh. & Buf.*)
N. Y., Pittsb'h & Chicago. 4-8½ g. 20 m. 2 lo. 32 c.
Geo. W. Dixon, *Supt*....New Galilee, Pa.
H. T. Hanna, *Pur. Agt*....Pittsburgh, Pa.
N. Y., Pennsylvania & Ohio R. R. (*See N. Y., L. E. & W.*)
New York, Philadelphia & Norfolk R. R.

4-8½ g. 10 m. 1 lo. 4 cars.
Jas. McConkey, *Supt*....Princess Ann, Md.
New York, Providence & Boston R. R.
4-8½ g. 83 m. 29 lo. 430 cars.
J. B. Gardner, *Supt*....Providence, R. I.
Giles F. Ward, *Pur. Agt*....Stonington, Conn.
J. H. Anderson, *M. M. & C. B.* Providence, R. I.
N. Y., Susqueh'na & W'n. 4-9 g. 147 m. 33 lo. 1,469 c.
F. A. Potts, *Gen. Man*....New York, N. Y.
C. D. McKelvey, *Asst. Supt*....Jersey City, N. J.
C. T. Demarest, *Pur. Agt*....New York, N. Y.
W. C. Ennis, *M. M. & C. B*...Wortendyke, N. J.
New York, Texas & Mexican Ry.
4-8½ g. 92 m. 6 lo. 95 cars.
Allen McCoy, *Gen. Man*....Victoria, Tex.
J. G. Conlon, *M. M*....Victoria, Tex.
New York, West Shore & Buffalo.
4-8½ g. 850 m. 98 lo. 2,907 c.
J. D. Layng, *Gen. Man*....New York, N. Y.
C. D. Gorham, *Gen. Supt*....Weehawken, N. J.
P. S. Bemis, *Pur. Agt*....New York, N. Y.
R. H. Soule, *Supt. M. P*....Frankfort, N. Y.
H. R. Div.: C. W. Bradley, *Supt.*, Weehawken, N. J.
Harry Linn, *M. M*....New Durham, N. J.
Moh'k Div.: H. W. Gardiner, *Supt.* Syracuse, N. Y.
Buff. Div.: D. B. McCoy, *Supt*....Buffalo, N. Y.
New York, Ontario & Western.
J. E. Childs, *Gen. Supt*....New York, N. Y.
N. Y. Woodhaven & Rockaway R. R. (*See Long Is.*)
N. Y. & Greenwood Lake Ry. (*See N. Y., L. E. & W.*)
N. Y. & Manhattan Beach Ry. (*See Long Island.*)
New York & Long Branch R. R. (*See Phil. & Read.*)
New York & New England R. R.
4-8½ g. 473 m. 145 lo. 3,959 cars.
W. H. Turner, *Gen. Supt*....Boston, Mass.
W. W. McKim, *Pur. Agt*....Boston, Mass.
J. B. Henney, *Supt. M. P*....Boston, Mass.
Geo. E. Boyden, *M. M*....Norwood, Mass.
Elias E. Pratt, *M. C. B*....Norwood, Mass.
East Div.: E. G. Allen, *Supt*....Boston, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
W. A. Stone, *M. M*....Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*....Hartford, Ct.
E. M. Humstone, *M. M*....Hartford, Ct.
West'n Div.: C. H. Platt, *Supt*....Fishkill, N. Y.
Woons'kt Div.:
E. N. Tucker, *Supt*....Needham, Mass.
New York & Sea Beach R. R. 4-8½ g. 6 m. 4 lo. 40 c.
C. W. Douglass, *Supt*....Bay Ridge, N. Y.
W. A. Sheldon, *Supt*....Bay Ridge, N. Y.
Newark, Somerset & Straitsville R. R. (*See B. & O.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 59 miles.
C. L. Kimball, *Gen. Supt*....Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.*, Dutchess Junction, N. Y
Newfoundland Ry. 3-6 g. 45 m. 7 lo. 41 c.
C. X. Hobbs, *Gen. Man*....St. John's, N'f'd.
Norfolk Southern R. R. 4-8½ g. 74 m. 7 lo. 182 c.
M. K. King, *Gen. Man. & Pur. Agt.* Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*....Norfolk, Va.
Norfolk & Ocean View Narrow Gauge R. R.
3 g. 8 m. 2 lo. 9 cars.
W. H. Taylor, *Pres*....Norfolk, Va.
Norfolk & Western R. R. (*See Shenandoah Val.*)
North-Eastern R. R. of Ga. 5 g. 72 m. 2 lo. 20 cars.
H. R. Bernard, *Supt*....Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars)
David Nye, *Gen. Supt*....San Rafael, Cal.
W. F. Russell, *Pur. Agt*....San Francisco, Cal.
E. L. Reese, *M. M*....Saucelito, Cal.
North Shore Ry. 4-8½ g. 209 m. 21 lo. 564 c.
W. Wainwright, *Gen. Man*....Montreal, Can.
A. Davis, *Supt. & Pur. Agt*....Quebec, Can
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, *Supt*....Concord, N. H.
M. M. & C. B. & Pur. Agt.. do.
Northern (N. J.) R. R. (*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Penna. R. R. (6) Div.*)
North'n Pacific R. R. 4-8½ g. 2,207 m. 391 lo. 9,897 c.
T. F. Oakes, *Gen. Man*....St. Paul, Minn.
John H. Ames, *Gen. Pur. Agt*..St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P., M. & R. S.* do.
J. C. Barber, *M. C. B*....Brainerd, Minn.
(1) E'n Div.: J. T. Odell, *A. Gen. Man.* St. Paul, Minn.
H. J. Small, *A. S. Mach*....Brainerd, Minn.
1st Gr. Div.: M. C. Kimberly, *Supt.* Brainerd, Minn.
Frank Howard, *M. C. B*....Brainerd, Minn.
2d Gr. Div.: J. M. Graham, *Supt.* Jamestown, Dak.
C. C. Quinn, *M. M*....Fargo, Dak.
A. Bardsley, *M. M*....Mandan, Dak.
F. Greene, *A. Supt*....Mandan, Dak.
3d Gr. Div.: S. R. Ainslie, *Supt*..Glendive, Mont.
S. L. Bean, *M. M*....Glendive, Mont.
J. C. Munro, *M. M*....Livingston, Mont.
(2) W'n Div.: J. M. Buckley, *Asst. Gen. Man.* New Tacoma, W. T.
H. D. Sanborn, *P. Agt*....Portland, Ore.
W. T. Small, *A. S. Mach*....Portland, Ore.
4th Gr. Div.: J. B. Cable, *Supt*...Missoula, Mont.
Jas. Walsh, *M. M*....Missoula, Mont.
J. Evans, *M. M*....Sprague, W. T.
5th Gr. Div.: Otis Sprague, *Supt*...Tacoma, W. T.
H. H. Warner, *M. M*....Tacoma, W. T.
Northern & North-W'n Rys. 4-8½ g. 378 m. 50 lo. 1,195 c.
James Webster, *Supt*....Toronto, Can.
W. C. Schreeber, *Pur. Agt*....Toronto, Can.
P. Clarke, *M. M*....Toronto, Can.
Nova Scotia Ry. 4-8½ g. 79 m. 9 lo. 268 c.
C. A. Scott, *Gen. Man*....New Glasgow, N. S.
M. F. Punch, *M. M*....New Glasgow, N. S.

O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,694 cars.
A. A. Gaddis, *Gen. Man*....Ogdensburg, N. Y.
E. B. Burnham, *Pur. Agt*...Ogdensburg, N. Y.
Abr. Klohs, *Supt. & M. M*....Malone, N. Y.
J. N. Brown, *Master Builder.* Ogdensburg, N. Y.
Ohio Central R. R. 4-8½ g. 325 m. 46 lo. 4,760 cars.
John E. Martin, *Rec*....Toledo, O.
T. M. Peelar, *Supt*....Bucyrus, O.
F. W. Stewart, *Pur. Agt*....Toledo, O.
J. B. Morgan, *M. M. & C. B*....Bucyrus, O.
Ohio Southern R. R. (*See Ind., Bloom. & W'n.*)
Ohio & Mississippi Ry. 4-9 g. 616 m. 113 lo. 2,501 cars.
W. W. Peabody, *Pres. & Gen. Man.* Cincinnati, O.
G. E. Atwood, *Pur. Agt*....Cincinnati, O.
J. H. Setchel, *Gen. M. M*....Cincinnati, O.
Cin. Div.: C. B. Cole, *Supt*....Seymour, Ind.
E. E. Jenks, *A. Gen. For*....Seymour, Ind.
J. P. Coulter, *M. C. B*....Aurora, Ind.
Arthur Donaldson, *M. M*....Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt.* St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt*....Louisville, Ky.
Oil City & Chicago R. R. (*See Buff., N. Y. & Phil.*)
Old Colony R. R. 4-8½ g. 470 m. 124 lo. 3,527 cars.
J. R. Kendrick, *Gen. Man*....Boston, Mass.
R. W. Husted, *Pur. Agt*....Boston, Mass.
Jas. N. Lauder, *Supt. R. S*....Boston, Mass.
Sam. Stevens, *S. Br. & Bld'gs*....Boston, Mass.
Main Li. Div.: J. H. French, *Supt*...Boston, Mass.
C. Berkley Powell, *M. M*....Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*..Hyannis, Mass.
C. Berkley Powell, *M. M*....Boston, Mass.
No. Div.: S. A. Webber, *Supt*....Fitchburg, Mass.
F. M. Twombly, *M. M*....Taunton, Mass
Oregon Ry. & Navigation Co.
3 & 4-8½ g. 577 m. 72 lo. 1,611 cars.
C. H. Prescott, *V. P. & Gen. Man.* Portland, Ore.
F. T. Dodge, *Supt.* (Riv. Div.)....Portland, Ore.
H. S. Rowe, *Supt.* (Ry Div.)....Portland, Ore.
J. M. Drake, *Pur. Agt*....Portland, Ore
Goodall, Perkins & Co., *Supt.* (Ocean Div.) San Francisco, Cal.
C. C. Hobart, *Gen. M. M*....The Dalles, Ore
Chas. A. Phipps, *M. C. B*....The Dalles, Ore.
Oregon & California R. R. 4-8½ g. 449 m. 43 lo. 626 c.
R. Koehler, *Gen. Man*....Portland, Ore.
J. Brandt, *Gen. Supt*....Portland, Ore.
W. T. Bodley, *Pur. Agt*....Portland, Ore.
A. Brandt, *M. M*....Portland, Ore.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
M. Newbold, *Supt*....Owensboro, Ky.
H. M. Gabel, *M. M. & C. B*....Owensboro, Ky.
Oxford & Henderson R. R. 4-8½ g. 13 m. 2 lo. 11 c.
James A. White, *Gen. Supt*...Henderson, N. C.

James E. Lawrence, M. M ... Henderson, N. C

P

Pacific Coast Ry. 3 g. 64 m.
J. M. Fillmore, Manager. San Luis Obispo, Cal.
W. H. Masterman, M. M. & C. B. do.
Painesville & Youngstown Ry. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, Rec. & Man. .... Painesville, O.
J. A. Newcome, Supt. R. S. ...... Painesville, O.
Panama R. R. 5 g. 48 m. 14 lo. 2,200 cars.
G. A. Burt, Gen. Supt. ..... Aspinwall, U. S. Col.
E. Z. Penfield, Pur. Agt. .... New York, N. Y.
Jas. Reilly, M. M. .... Aspinwall, U. S. Col
Passumpsic R. R. 4-8½ g. 147 m. 28 lo. 1,101 cars.
E. Raymond, Pres. & Pur. Agt. Boston, Mass.
H. E. Folsom, Supt. .... Lyndonville, Vt.
L. L. Brigham, M. M. .... Lyndonville, Vt.
L. F. Woodard, M. C. B .... Lyndonville, Vt.
Paulding & Cecil Railway. 4-8½ g. 7 m. 3 lo. 28 c.
S. Frank Eagle, Pres. .... Cecil, O.
Paw Paw and Toledo & South Haven R. Rds.
3 g. 20 m. 3 lo. 16 cars.
John Ihling, Supt. .... Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
B. B. Newton, Supt. & Pur. Agt. .. Oxford, Pa.
E. H. Williams, M. C. B .... York, Pa.
W. P. Kirk, M. M. .... Oxford, Pa.
Pemigewasset Valley R. R. 4-8½ g. 21 m. 2 lo. 127c.
J. Thomas Vose, Pres. .... Boston, Mass.
Pennsylvania Co.'s (5) Roads.
4-9 g. 3,222 m. 920 lo. 32,809 cars.
Gen. Divs. (1), (2), (3), (4) and (5).
Wm. A. Baldwin, Gen. Man. .... Pittsburg, Pa.
John Thomas, Gen. Supt. ...... Pittsburg, Pa.
Wm. Mullins, Gen. Pur. Agt. .... Pittsburg, Pa.
Joseph Wood, Supt. M. P. .... Fort Wayne, Ind.
(1) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 288 lo. 8,023 cars.
E'n Div.: A. B. Starr, Supt. .... Allegheny, Pa.
Geo. J. Parkin, M. M. .... Allegheny, Pa.
D. M. Peppard, M. M. .... Crestline, O.
W'n Div.: C. D. Law, Supt. .... Ft. Wayne, Ind.
F. D. Casanave, M. M. .... Ft. Wayne, Ind.
A. H. Somers, Gen. For. Shops... Chicago, Ill.
(2) Ashtabula & Pittsburg, and
(3) Erie & Pittsburg R. Rds. 221 m. 29 lo. 1,362 c.
John M. Kimball, Supt. . Lawrence Junc., Pa.
J. A. Wood, Gen. For. Shops .... Erie, Pa.
(4) Cleveland & Pittsb'g R. R. 225 m. 97 lo. 3,534 c.
R. F. Smith, Asst. Man. .... Cleveland, O.
Philip Bruner, Supt. .... Wellsville, O.
W. F. Beardsley, Mast. of Mach. Wellsville, O.
(5) Nc-W'n Ohio Ry.: J. S. Morris, Supt. .. Toledo, O.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 3,158 m. 1,459 loco. 66,816 cars.
Chas. E. Pugh, Gen. Man. ..... Philadelphia, Pa.
Enoch Lewis, Pur. Agt. .... Philadelphia, Pa.
John Reilly, Supt. Trans. ..... Philadelphia, Pa.
T. N. Ely, Gen. S. M. P. .... Altoona, Pa.
Pennsylvania R. R. Divs.
4-9 g. 1,213 m. 705 lo. 46,819 cars.
S. M. Prevost, Gen. Supt. ... . Altoona, Pa.
Frank L. Sheppard, Supt. M. P. . Altoona, Pa.
G. W. Strattan, M. M. .... Altoona, Pa.
Jno. P. Levan, Gen. Fore. ...... Altoona, Pa.
Phila. Div.: Tho. Gucker, Supt. Philadelphia, Pa.
H. D. Garrett, M. M. ... W. Philadelphia, Pa.
I. W. Van Houten, Gen. For. ... W. Phila., Pa.
Mid. Div.: O. E. McClellan, Supt. Harrisburg, Pa.
E. L. Caum, M. M. .... Harrisburg, Pa.
Samuel W. Myers, Gen. For. Harrisburg, Pa.
Altoona Div.: Jas. Reed, Supt. ...... Altoona, Pa.
Pitts. Div.: Robert Pitcairn, Supt. ... Pittsburg, Pa.
D. O. Shaver, M. M. .... Pittsburg, Pa.
J. G. Stewart, Gen. For. .... Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, Supt. Blairsville, Pa.
Wm. B. Norris, M. M. .... Blairsville, Pa.
M. H. Falls, Gen. For. .... Blairsville, Pa.
Fred. Div.: J. B. Hutchinson, Supt. .... York, Pa.
Tyrone Div.: S. S. Blair, Supt. .... Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, Supt. Lewistown, Pa.
Bed. Div.: R. L. Holliday, Supt. ..... Bedford, Pa.
Monong. Div.: David M. Watt, Supt. Pittsburg, Pa.
Wm. Lininger, M. M. .... Pittsburg, Pa.
(2) United R. Rs. of N. J. Divs. 471 m. 330 lo. 4,041 c.
F. Wolcott Jackson, Gen. St. Jersey City, N. J.
H. S. Hayward, Supt. M. P. . Jersey City, N. J.
David H. Baker, Gen. For. .. Jersey City, N. J.
N. Y. Div.: Robt. E. Pettit, Supt. Jersey City, N. J.
L. A. Bosdevex, M. M. ... Jersey City, N. J.
E. F. Bosdevex, Gen. For. . Jersey City, N. J.
Belv. Div.: J. A. Anderson, Supt. Lambertv., N. J.
R. McDowell, M. M. ...... Lambertville, N. J.
Amboy Div.: I. S. Buckalew, Supt. Camden, N. J.
Thos. Kerr, M. M. .... So. Amboy, N. J.
P. S. Bogart, Gen. For. ..... So. Amboy, N. J.
(2½) Camden & At. Rd.: 75 m. 18 l. 261 c.
W. N. Bannard, Supt. .... and
Rufus Hill, M. M. .... Camden, N. J.
Samuel Wills, M. C. B .... Camden, N. J.
(3) West Jersey R. R. 4-9 g. 188 m. 27 lo. 294 cars.
Joseph Crawford, Gen. Supt. .... Camden, N. J.
W. McAlister, M. M. .... Camden, N. J.
C. C. Williams, Gen. For. .... Camden, N. J.
(4) Phila., Wilm. & Balt. R. R. 409 m. 128 lo. 1,882 c.
H. F. Kenney, Gen. Supt. .... Philadelphia, Pa.
J. M. Wallis, S. M. P. .... Philadelphia, Pa.
H. D. Gordon, M. M. .... Wilmington, Del.
W. H. Lungren, M. C. B ..... Wilmington, Del.
Cen. Div.: L. K. Lodge, Supt. .... Media, Pa.
Del. Div.: I. N. Mills, Supt. ..... Wilmington, Del.
Md. Div.: H. H. Carter, Supt. . Wilmington, Del.
(5) Phila. & Erie R. R. Divs.: 437 m. 110 lo. 3,089 c.
R. Neilson, Gen. Supt. ... .. Williamsport, Pa.
A. O. Dayton, Supt. Mo. Po. Williamsport, Pa.
E'n. Div.: E. B. Westfall, Supt. Williamsport, Pa.
Sun. H. & W. Div: A. Walter, Supt.; and
H. K. Stout, M. M. ... ... Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, Supt. .... Renovo, Pa.
Wm. L. Holman, M. M. .... Renovo, Pa.
West'n Div.: J. W. Reynolds, Supt. .... Erie, Pa.
W. T. Smith, M. M. .... Erie, Pa.
(6) Northern Central Ry. 4-9 g. 346 m. 152 lo. 6,610 c.
Robert Neilson, Gen. Supt. .. Williamsport, Pa.
A. O. Dayton, Supt. M. P. ... Williamsport, Pa.
A. W. Sumner, Pur. Agt. .... Baltimore, Md.
J. M. Coale, M. M. .... Baltimore, Md.
G. W. Demarest, Gen. For. ..... Baltimore, Md.
Susq. Div.: E. B. Westfall, Supt. Williamsport, Pa.
Sham. Div.: A. Walter, Supt. ..... Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, Supt. . Elmira, N. Y.
Jas. Strode, M. M. .... Elmira, N. Y.
J. C. Dyott, Gen. For. .... Elmira, N. Y.
Baltimore Div.: H. W. Kapp, Supt. Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 125 m. 30 lo. 300 c.
H. F. Kenny, Gen. Supt. ...... Philadelphia, Pa.
A. W. Sumner, Pur. Agt. ...... Baltimore, Md.
J. M. Wallis, Supt. Mo. Po. ... Philadelphia, Pa.
H. D. Gordon, M. M. .... Wilmington, Del.
J. Lescallett, For. Mach. Shop. Washington, D. C.
R. F. Downs, For. Car Shop. Washington, D. C.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 3,271 c.
J. B. Smith, Gen. Supt. ...... Dunmore, Pa.
And. Crane, M. M. .... Dunmore, Pa.
Geo. W. Simpson, M. C. B .... Dunmore, Pa.
Pennsylvania, Slatington & New England R. R.
In progress. 4-8½ g. 18 m. 1 lo. 20 cars.
C. H. Stanton, Supt. .... New York, N. Y.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, Gen. Supt. .... Ridgeway, Pa.
Pensacola & Atlantic R. R. 5 g. 161 m. 9 lo. 67 cars.
W. D. Chipley, Gen. Supt. ...... Pensacola, Fla.
W. D. Robb, M. M. .... Pensacola, Fla.
Pensacola & Perdido R. R. 5 g. 10 m. 5 lo. 92 cars.
B. F. Simmons, Pr. & Supt. .... Pensacola, Fla.
H. W. Simmons, Pur. Agt. ..... Pensacola, Fla.
J. C. Schutte, M. M. .... Pensacola, Fla.
People's Ry. 4-8½ g. 15 m. 2 lo. 14 cars.
W. D. Pollard, Supt. .... Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,660 cars.
G. L. Bradbury, Gen. Man. .... Peoria, Ill.
P. Reilly, M. M. .... Mattoon, Ill.
Peoria & Farmington R. R. (See Cen. Ia.)
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 106 c.
Thos. B. Burnett, Gen. Supt. & P. A. Peoria, Ill.
R. F. Hurd, M. M. & C. B. .... Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, Supt. ..... Perkiomen Junction, Pa.
H. Boyd, Pur. Agt. .... Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 133 cars.
R. M. Sully, Gen. Supt. .... Petersburg, Va.
Geo. F. Jones, Pur. Agt. ...... Petersburg, Va.
R. B. Andrews, M. M. .... Petersburg, Va.
J. W. Fleming, M. C. B .... Petersburg, Va.
Phila., Wilmington & Balt. R. R. (See Penna. R. R.)
Peterborough & Hillsborough. (See Northern, N. H.)
Philadelphia, Newtown & New York R. R.
4-8½ g. 23 m.
W. M. Geary, Supt. .... Philadelphia, Pa.
Phila. & Atlantic City Ry. 3-6 g. 55 m. 11 lo. 134 cars.
F. S. Urie, Supt. .... Philadelphia, Pa.
W. S. Wilson, Pur. Agt. .... Philadelphia, Pa.
H. M. Messimer, M. M. .... Camden, N. J.
E. Lippincott, M. C. B .... Camden, N. J.
Philadelphia & Erie R. R. (See Penna. R. R.; (5) Div.)
Philadelphia & Reading R. R. (and Branches.)
4-8½ g. 1,582 m. 907 lo. 56,775 cars.
John E. Wootten, Gen. Man. . Philadelphia, Pa.
W. S. Wilson, Pur. Agt. ..... Philadelphia, Pa.
Geo. Eltz, Supt. Trans. .... Reading, Pa.
L. B. Paxson, Eng. of Mach. ...... Reading, Pa.
No. Pa. & Bound Brook Div.:
I. A. Sweigard, Supt. .... Philadelphia, Pa.
Mahanoy & Shamokin and other Brs.:
J. H. Olhausen, Supt. .... Pottsville, Pa.
D. C. Reinhart, Asst. Supt. ... Catawissa, Pa.
A. A. Hesser, Asst. Supt. Mahanoy Plane, Pa.
Schuylkill & Susquehanna Br.:
H. H. Tracy, Supt. .... Pine Grove, Pa.
Reading & Columbia Br.:
A. M. Wilson, Supt. .... Columbia, Pa.
(2) N. J. Central Div.:
W. W. Stearns, Supt. .... Elizabeth, N. J.
W. Woodcock, M. M. ...... Elizabethport, N. J.
Geo. Hackett, M. C. B .... Elizabethport, N. J.
C. G. Williams, M. M. .... Jersey City, N. J.
John Alpaugh, M. M. .... Phillipsburg, N. J.
L. Br. Div.: R. Blodgett, Supt. .. Long Branch, N. J.
N. J. So. Div.: W. W. Stearns, Supt. Elizabeth, N. J.
Wm. Montgomery, M. M. ... Manchester, N. J.
Chas. N. Sawyer, M. C. B ... Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, Supt. ... Mauch Chunk, Pa.
Pittsburg, Bradford & Buffalo Ry. (See Pitts. & West.)
Pittsburg, Chartiers & Youghiogheny R. R.
4-8¾ g. 19 m.
Geo. S. Griscom, Gen. Man. ..... Pittsburg, Pa.
Pittsburgh, Cincinnati & St. Louis Ry. (5 Gen. Divs.)
4-9 g. 916 m. 239 lo. 7,133 cars.
James McCrea, Manager. .... Columbus, O.
Wm. Mullins, Pur. Agt. ...... Pittsburg, Pa.
Edward B. Wall, Supt. M. P. ..... Columbus, O.
(1) P., C. & St. L. Div.: E. B. Taylor, Supt. Pittsburg, Pa.
C. B. Street, M. M. .... Dennison, O.
J. M. Copeland, G. F. Car Shops. Steubenville, O.
(2) C. & M. V. Div.: W. F. Black, Supt. . Zanesville, O.
Leroy Kells, M. M. .. .. Lancaster, O.
Wm. Meikle, Gen. For. .... Lancaster, O.
Daniel Jewell, Gen. F. Car Shops. Lancaster, O.
(3) Li. Mi. Div.: Ralph Peters, Supt. ... Cincinnati, O.
Leroy Kells, M. M. .... Cincinnati, O.
Jos. Underwood, G. F. Car Shops. Cincinnati, O.
(4) J. M. & I. R. R.: E. W. McKenna, Supt. Louisville, Ky.
Wm. Swanston, M. M. ... Jeffersonville, Ind.
Edw. Austin, G. F. C. Shops. Jeffersonville, Ind.
(5) Indianapolis & Vincennes R. R.
J. J. Turner, Supt. .... Indianapolis, Ind.
Pittsburgh, Cleveland & Toledo R. R.
4-8¾ g. 78 m. 18 lo. 525 cars.
C. H. Andrews, Pres. .... Youngstown, O.
J. T. Johnson, Supt. .... Allegheny, Pa.
W. F. Hofecker, M. M. ... ... Youngstown, O.
Pittsburg, Ft. Wayne & Chicago Ry. (See Penna. Co.)
Pittsburg Southern Ry. (See Balt. & O.
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 428 c.
James M. Bailey, Gen. Supt. .... Pittsburg, Pa.
Holmes Ward, M. M. ...... Castle Shannon, Pa.
Wm. E. Long, M. C. B ... . Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4-8¾ g. 70 m. 31 lo. 1,820 c.
W. C. Quincy, Gen. Man. .... Pittsburg, Pa.
R. W. Jones, Mast. Trans. ...... Pittsburg, Pa.
S. W. Haines, M. M. .... Pittsburg, Pa.
Pittsburgh, McKeesport & Youghiogheny.
4-8¾ g. 57 m. 19 lo. 267 cars.
W. C. Quincy, Gen. Man. ..... Pittsburgh, Pa.
R. W. Jones, M. of Trans. ..... Pittsburgh, Pa.
S. W. Haines, M. M. .... Pittsburgh, Pa.
Pitts. & Western R. R. 3 & 4-8½ g. 110 m. 18 lo. 365 c.
Pitts., Bradford & Buff. Ry. 3 g. 93 m. 8 lo. 163 c.
Tho. M. King, Gen. Man. .... Allegheny, Pa.
J. T. Johnson, Supt. ... . Allegheny, Pa.
N. Bruce, Pur. Agt. .... Allegheny, Pa.
W. M. Flahavhan, M. M. .... Allegheny, Pa.
Pontiac, Oxford & Pt. Austin R. R. 100 m.
Geo. W. Debevoise, Pr. & Gen. Man. Oxford, Mich.
Jas. Houston, Gen. Supt. .... Oxford, Mich.
Port Huron & No.-Western Ry. 3 g. 218 m. 14 lo. 288 c.
H. McMorran, G. Man. & P. A. Port Huron, Mich.
J. R. Wadsworth, Supt. .. ... Port Huron, Mich.
Chas. Deifenbach, M. M. ..... Port Huron, Mich.
Benj. Hillier, M. C. B .... Port Huron, Mich.
Port Jervis & Monticello R. R. 4-8½ g. 24 m. 3 lo. 13 c.
M. V. Heller, Gen. Man. ..... Port Jervis, N. Y.
Port Royal & Augusta Ry. 5 g. 180 m. 16 lo. 310c.
J. N. Bass, Supt. .... Augusta, Ga.
T. F. Warwick, M. M. & M. C. B. Augusta, Ga.
Portland & Ogdensburg. 4-8½ g. 110 m. 11 lo. 311 c.
J. Hamilton, Gen. Supt. & P. A. . Portland, Me.
M. M. .... Portland, Me.
W. G. Brewer, M. C. B .... Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 7 lo. 230 c.
J. W. Peters, Supt. & Pur. Agt. . Portland, Me.
E. H. C. Tompson, For. of Mach. . Portland, Me.
David Dow, For. of Car Repairs. Portland, Me.
Potomac, Fred.'g & Pied. R. R. 3 g. 38 m. 2 lo. 38 c.
Will M. Grafton, Supt. .... .. Fredericksburg, Va.
W. J. Sweigard, M. M. .... Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4-8½ g. 45 m. 4 lo. 65 c.
J. A. Perkins, Supt. .... Poughkeepsie, N. Y.
John L. Donaldson, M. M. Poughkeepsie, N. Y.
Pratt Coal & Coke Company's R. R. 5 g. 9 m. 5 lo. 100 c.
W. L. Gude, Gen. Man. .... Pratt Mines, Ala.
Prescott & Thirty-Fifth Parallel R. R.
4-8½ g. 77 miles in progress.
Samuel A. Henszey, Gen. Man. Prescott, Ariz.
Prince Edward Island Ry. 3-6 g. 199 m. 18 lo. 280 c.
Jas. Coleman, Supt. & Pur. Agt.;
Jos. Unsworth, M. Supt. & Storekeeper; and
D. M. Fraser, M. C. B. . Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 15 m. 3 lo. 18 c.
Emmons Raymond, Pur. Agt. . Boston, Mass.
C. H. Greenleaf, Supt. .... Profile House, N. H.
Prospect Park & Coney Island R. R.
4-8½ g. 15 m. 8 lo. 123 cars.
R. Schermerhorn, Supt. .... Brooklyn, N. Y.
Martin Painter, M. M. .... Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 6 lo. 79 c.
Waterman Stone, Supt. .. ... Providence, R. I.
Rufus Smith, M. M. & C. B .... Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 4 lo. 92 c.
Wm. Tinkham, Gen. Man. .... Providence, R. I.
G. T. Richardson, M. M. ...... Providence, R. I.
Prov. & Worcester. 4-8½ g. 66 m. 34 lo. 1,155 c.
W. E. Chamberlain, Supt. .... Providence, R. I.
A. Griggs, Supt. L. & C. D. ... Providence, R. I.
Pullman's Palace Car Co. 564 passenger cars.
A. B. Pullman, 2d V.-Pr. & G. M. . Chicago, Ill.
Geo. F. Brown, Gen. Supt. .... Chicago, Ill.
Wm. A. Angell, Pur. Agt. ... . Chicago, Ill.
S. W. Bretzfield, Asst. Pur. Agt. New York, N. Y.
A. Rapp, Man. (Chicago Works) .. Chicago, Ill.
H. L. Spaulding, Man. (Det. Shops). Detroit, Mich.
E. A. Benson, Supt. Shops ... ... St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 147 m. 10 lo. 267 cars.
J. R. Woodward, Gen. Man. . Sherbrooke, P. Q.
A. Steele, Supt. .... Sherbrooke, Que.
R. D. Morkill, Jr., Pur. Agt. Sherbrooke, P. Q.
Jas. Seiveright, M. M. ...... Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4-8½ g. 354 m. 36 lo. 993 cars.
L. .. Seneca, Gen. Supt. .... Quebec, Que.
Quebec & Lake St. John Ry. 4-8½ g. 36 m. 3 lo. 55 c.
J. G. Scott, Manager. .... Quebec, Can.
Frank Fournier, Supt. ... ... St. Raymond, P. Q.
John T. Eames, M. M. ..... St. Raymond, P. Q.
Queen Anne's & Kent and Townsend Branch R. R.
(See Penna.; (4) Div.)

R

Raleigh & Augusta Air-Line; Carolina Central.
Raleigh & Gaston R. Rs. 4-8½ g. 436 m. 50 lo. 904 c.
John C. Winder, Gen. Man. & P. A. Raleigh, N. C.
Raleigh Rds. 4-8½ g. 194 m. 22 lo. 563 cars.
B. R. Harding, Supt. of Mach. Raleigh, N. C.
Carolina Cen. R. R. 4-8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, Supt. ... . Wilmington, N. C.
James Maglenn, M. of Mach. Laurinburg, N. C.
S. R. Ethridge, M. C. B ... Laurinburg, N. C.
Rensselaer & Saratoga R. R. (See Del. & Hud. Can. Co.)
Rhinebeck & Connecticut. (See Hart. & Ct. Wn.)
Richmond, Fredericksburg & Potomac R. R.
4-8½ g. 83 m. 15 lo. 146 cars.
E. T. D. Myers, Gen. Supt. .. Richmond, Va.
T. L. Courtney, Asst. Supt. .. Richmond, Va.
H. Kuhn, M. M. .... Richmond, Va.
W. H. Trainham, M. C. B. ... Richmond, Va.
Richmond & Alleghany R. R. 4-9 g. 261 m. 19 lo. 837c.
Decatur Axtell, Rec. & Gen. Man. Richmond, Va.
M. Sweeney, Pur. Agt. ... . Richmond, Va.
Geo. D. Harris, M. M. & C. B. ... Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,736 miles 218 loco. 3,833 cars.
A. L. Rives, Gen. Man. .... Richmond, Va.
Peyton Randolph, As. G. Man. . Richmond, Va.
J. P. Minetree, Pur. Agt. .... Richmond, Va.
R. D. Wade, Supt. Mo. Po. ..... Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 847 m. 131 lo. 2,687 cars.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c.
Wm. H. Green, Supt. .... Richmond, Va.
T. W. Gentry, M. M. ... . Richmond, Va.
J. B. Vaughan, For. Car Sh. .. Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, Supt. .... Raleigh, N. C.
W. H. Turrentine, M. M. Comp'y's Shops, N. C.
J. C. Holt, For. Car Sh. Comp'y's Shop, N. C.
Atlanta & Char. Air Line. 5 g. 286m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 41 c.
Edmund Berkley, Supt. .... Atlanta, Ga.
W. A. Walden, M. M. .. .. Atlanta, Ga.
Z. T. Smith, For. Car Sh. ... ... Atlanta, Ga.
(2) Charlotte, Col. & Aug. R. R. 5g. 239 m. 22 lo. 287 c.
G. R. Talcott, Supt. .... Columbia, S. C.
J. H. Green, M. M. (2 roads) .. Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 224 c.
G. S. Talcott, Supt. .... Columbia, S. C.
J. O. Meredith, For. E. & C. Rep. .. do.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, Eng. & Supt. Alexandria, Va.
J. E. Waddey, M. of M. ...... Alexandria, Va.
J. T. Nalls, M. C. B. .... Alexandria, Va.
Richmond & Petersburg R. R. 4-8½ g. 25 m. 8 lo. 132 c.
J. R. Kenly, Supt. .... Richmond, Va.
John O'Brien, M. M. .... Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 40 cars.
M. J. Gomila, Rec. & Gen. Man. Brownsville, Tex.
G. W. Rendall, M. M. .... Brownsville, Tex.
M. Markwood, M. C. B ..... Brownsville, Tex.
Rio Grande & Pecos Ry. 4-8½ g. 27 m. In progress.
W. W. Hungerford, Man. .... Laredo, Tex.
Rochester & Lake Ontario Ry. 4-8½ g. 6 m. 2 lo. 10 c.
N. B. Ellison, Man. .... Rochester, N. Y.
Rochester & Pittsb'g. R. R. 4-8½ g. 260 m. 60 lo. 3,146 c.
Geo. E. Merchant, Gen. Man. .. Rochester, N. Y.
J. T. Gardiner, Gen. Supt. ..... Buffalo, N. Y.
J. P. Hovey, M. M. .... Rochester, N. Y.
J. R. Sherburne, For. Sh. .... Buffalo, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 13 lo. 357 c.
R. R. Cable, V.-P. & Gen. Supt. . Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, Supt. & P. A. do.
Joseph Elder, M. M. .... Peoria, Ill.
R. I. & M. C. Rd.: B. T. Cable, Supt. R'k Island, Ill.
J. H. Parks, M. M. .... Rock Island, Ill.
Rogersville & Jefferson R. R. 5 g. 16 m. 1 lo. 6 cars.
C. M. Leuty, Supt. .... Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 17 cars.
Eben Hillyer, Supt. .... Rome, Ga.
O. W. Harbin, M. M. & C. B .... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 417 m. 61 lo. 1,831 cars.
H. M. Britton, Gen. Man. & P. A. Oswego, N. Y.
Geo. H. Haselton, S. M. P. & M. . Oswego, N. Y.
E'n Div.: J. D. Remington, A. Supt. Watertown, N. Y.
W'n Div.: W. H. Chauncey, A. Supt. Oswego, N. Y.
Roodhouse & Scottsville Ry. In progress.
Geo. P. Merrill, Gen. Man. .... Chicago, Ill.
Ruby Hill R. R. (See Eureka & Pal.)
Rumford Falls & Buckfield R. R. 4-8½ g. 29 m. 2 l. 62 c.
L. L. Lincoln, Supt. & Pur. Agt. .. Canton, Me.

S

Sabine & East Texas Ry. (See Cen. Pac.)
Sacramento & Placerville R. R. (See Cen. Pac.)
Saginaw Bay & Northw'n R. R. 4-8½ g. 31 m. 6 lo. 136 c.
J. Jackson, Gen. Man. ... ... Pinconning, Mich.
F. T. Lillote, Act. Pur. Agt. .. Pinconning, Mich.
Edward Keeler, M. M. .... Pinconning, Mich.
Saginaw, Tuscola & Huron R. R.
3 g. 50 m. 3 lo. 83 cars.
M. B. Wilkinson, Gen. Supt. . E. Saginaw, Mich.
Saginaw Valley & St. Louis R. R. 4-8½g. 39 m. 4 l. 64 c
N. W. Merrill, Supt. .... Saginaw, Mich.
Allan Bourn, Pur. Agt. .. .. Detroit, Mich.
Geo. C. Watrous, M. M. ... . Iona, Mich.
Salisbury R. R. 4-8½ g. 11 m. 1 lo. 1 car.
R. J. Batzer, Supt. .... Pittsburgh, Pa.
Salt Lake & Western R. R. (See Un. Pac.; (6) Div.)
San Francisco & No. Pac. 4-8½ g. 139 m. 11 lo. 245 c.
Arthur Hughes, Gen. Man. . San Francisco, Cal.
H. C. Whiting, Supt. .... Petaluma, Cal.
Ed. Reynolds, Gen. M. M. .... Donahue, Cal.
Ed. Reynolds, M. C. B .... Donahue, Cal.
Sanborn, Cooperstown & Turtle M. R. R. In progress.
C. A. Roberts, Gen. Man. ..... Sanborn, Dak.
Sandy River R. R. 2 g. 18 m. 3 lo. 36 cars.
N. B. Beal, Pres. & Supt. ... . Phillips, Me.
M. Saunders, M. M. & C. B .... Phillips, Me.
Sandusky, Mansfield & Newark R. R. (See B. & O.)
Sanford & Indian River R. R. (See So. Flor.)
San Luis Obispo & Santa Maria R. R.
3 g. 20 m. 2 lo. 30 cars.
Charles Goodall, Man. ..... San Francisco, Cal.
San Pete Valley R. R. 3 g. 33 m. 2 lo. 57 cars.
F. C. Hand, Supt. .... Wales, U. T.
J. E. Bamberger, Pur. Agt. .... Salt Lake, U. T.
B. Bates, M. M. .... Wales, U. T.
Santa Cruz R. R. (See So. Pac.; Nor'n Div.)
Saratoga, Mt. McGregor & Lake George R. R.
3 g. 11 m. 3 lo. 12 cars.
John McGee, Supt. .... Saratoga Springs, N. Y.
Savannah, Florida & W'n Ry. 5 g. 425 m. 50 lo. 736 c.
H. S. Haines, Gen. Man. .... Savannah, Ga.
R. G. Fleming, Supt. .... Savannah, Ga.
F. S. Pendergast, Ch. Eng. .... Savannah, Ga.
A. A. Aveilhé, Pur. Agt. .... Savannah, Ga.
G. M. D. Riley, M. of Mach. ..... Savannah, Ga.
E. Giffken, For. Car Dept. ...... Savannah, Ga.
Sav., Griffin & No. Ala. R. R. Op. by Central (Ga.).
Schuylkill & Lehigh R. R. (See Phil & Read.)
Scoharie Valley R. R. (See Middleburg & Sch.)
Scioto Valley R. R. 4-8¾ g. 132 m. 17 lo. 548 cars.
Geo. Skinner, Supt. & P. A., t. .... Columbus, O.
R. Bromley, M. M. ... . Portsmouth, O.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 384 c.
E. G. Ghio, Mast. of Trans. ... Portsmouth, Va.
J. A. Walton, Pur. Agt. .... Portsmouth, Va.
M. M. Pendleton, S. M. P. & M. Portsmouth, Va.
Sedalia, Warsaw & Southern Ry. (See Mo. Pac.)
Sharpsville R. R. 4-8½ g. 23 m. 3 lo. 13 cars.
Walter Pierce, Gen. Man. .... Sharpsville, Pa.
Shenandoah Valley R. R. 4-9 g. 249 m. 32 lo. 849 c.
Norfolk & Western R. R. 5 g. 486 m. 82 lo. 1,779 c.
J. H. Sands, Gen. Supt. .... Roanoke, Va.
W. C. De Armond, Pur. Agt. .. Philadelphia, Pa.
Chas. Blackwell, Supt. of M. P. .. Roanoke, Va.
W. A. Morgan, M. C. B .... Lynchburg, Va.
Sh. Val. Rd.: D. W. Flickwir, Supt. Roanoke, Va.
N. & W.; W. Div.: Frank Huger, Supt.; and
N. & W.; E. Div.: N. M. Osborne, Supt.; and
J. T. Robinett, M. M. ..... Petersburg, Va.
Shenango & Allegheny R. R. 4-9½ g. 57 m. 8 lo. 248 c.
J. T. Blair, G. Man. & Pur. Agt. Greenville, Pa.
Edw. Richardson, M. M. & C. B. Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 28 cars.
Edwin McNeill, Supt. .... Litchfield, Ct.
F. J. Broughet, M. M. .... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, Supt. & Pur. Agt. ... Ripley, Miss.
W. H. Phelps, M. M. .... Ripley, Miss.
Silver City, Deming & Pacific R. R. 3 g. 47 m. 3 l. 141 c.
John W. Smith, Gen. Supt. ... Silver City, N. M.
Silver Lake Ry. 4-8½ g. 6 m. 1 lo. 4 cars.
S. L. Chapin, Supt. .... Perry, N. Y.
Sinaloa & Durango R. R. 4-8½ g. 38 m. 2 lo. 40 cars.
Geo. S. Skilton, Supt. ...... Altata, Sinaloa, Mex.
John E. Bell, M. M. .... Culiacan, Mex.
Skaneateles R. R. 4-8½ g. 5 m. 2 lo. 5 cars.
J. McNamara, Supt. .... Skaneateles, N. Y.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 28 lo. 785 c.
P. E. Hall, Gen. Man. & P. A. Cedar Rapids, Ia.
C. M. Lawler, Gen. Supt. .... Missouri Valley, Ia.
W. G. Brownson, Asst. Supt. ... Norfolk, Neb.
S. A. Teal, M. M. .... Missouri Valley, Ia.
W. H. Ramseyer, M. C. B. .. Missouri Valley, Ia.
Smyrna & Delaware Bay R. R. (See Kent County.)
Sodus Bay & Southern Ry. 4-8½ g. 34 m. 4 lo. 40 c.
G. H. Stearns, Gen. Man. .. Sodus Point, N. Y.
G. H. Stearns, Supt. & Pur. Agt. Sodus Point, N. Y.
F. H. Garlock, M. M. .... Sodus Point, N. Y.
C. H. Hill, M. C. B .... Sodus Point, N. Y.
Somerset R. R. 4-8½ g. 25 m. 3 lo. 24 cars.
W. M. Ayer, Supt. & Pur. Agt. ..... Oakland, Me.
S. P. Mosher, For. Car Rep. ... No. Anson, Me.
C. Crowell, For. Lo. Rep's. .... No. Anson, Me.
Somerset & Cambria R. R. (See B. & O.
Sonora Ry. (See A., T. & S. Fe.)
South & North Alabama R. R. (See Louis. & Nash.)
South Carolina Ry. 5 g. 246 m. 46 lo. 834 cars.
John B. Peck, Gen. Man. .... Charleston, S. C.
S. B. Pickens, Pur. Agt. .... Charleston, S. C.
P. J. Cochrane, Mast. of Mach. Charleston, S. C.
Geo. H. Gramling, M. C. B. ... Charleston, S. C.
South-Eastern Ry. 4-8½ g. 280 m. 30 lo. 1,000 cars.
T. A. McKinnon, Gen. Man. .... Montreal, Can.
A. G. Eastman, M. M. .... Farnham, P. Q.
South Florida R. R. 3 gauge 115 m. 13 lo. 250 cars.
B. R. Swoope, Supt. & P. A. .... Sanford, Fla.
R. Derby, M. M. .... Sanford, Fla.
A. D. Stentiford, M. C. B. .... Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, Supt. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 16 lo. 500 cars.
M. Fillmore, Supt. ... . San Francisco, Cal.
G. H. Waggoner, Pur. Agt. . San Francisco, Cal.
D. E. Arnold, M. M. & C. B .... Newark, Cal.
South-Western R. R. (Ga.) (See Central of Ga.)
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, Supt. .... Harrodsburg, Ky.
J. Tomlinson, Pur. Agt. ...... Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 156 m. 21 lo. 467 c.
James G. Knapp, Gen. Supt. & P. A. Auburn, N. Y.
John White, M. M. ... . Auburn, N. Y.
H. Mooney, M. C. B .... Auburn, N. Y.
Southern Kansas Ry. (See At., Top. & Santa Fe.)
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 20 c.
Robert Knight, Supt. .... Brandywine, Md.
C. R. Joyce, M. M. .... Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 198 m. 30 lo. 728 c.
Northern Div. (For other Divs. see Cen. Pac.)
A. C. Bassett, Supt. ...... San Francisco, Cal.
J. R. Watson, Pur. Agt. .... Sacramento, Cal.
J. T. Wilson, M. M. ...... San Francisco, Cal.
F. N. Bellisle, M. C. B ... San Francisco, Cal.
Southern Pacific R. R. of Arizona. (See Cen. Pac.)
Southern Pacific R. R. of New Mexico. (See Cen. Pac.)
Spartanburg, Union & Columbia R. R.
(See Rich. & Dan.; (3) Div.
Spring Brook R. R. 4-3 g. 8 m. 1 lo. 18 cars.
Charles Pugh, Pres. .... Pittston, Pa.
Spring Hill & Parrsboro Ry. (See Cumberland.)
Springfield, Effingham & So.-E'n Ry. (See Ind. & Ill.)
Springville & Sardinia Ry. 4-8½ g. 12 m. 1 lo. 8 c.
Bertrand Chaffee, Pres. ..... Springville, N. Y.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, Supt. & Pur. Agt. . Calais, Me.
G. H. Corsen, M. M. .... Milltown, Me.
H. C. Tincker, M. C. B .... Milltown, Me.
St. John & Maine Ry. (See New Brunswick.)
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, Pr. & Supt. . Jacksonville, Fla.
Geo. Ferro, M. of Mach. .... Tocoi, Fla.
St. John's & Lake Eustis Ry. 3 g. 36 m.
W. J. Jarvis, Supt. .... Ft. Mason, Fla.
St. Johnsb'ry & Lake Champ. 4-8½ g. 120 m. 10 lo. 372 c.
A. B. Jewett, Supt. & P. A. . St. Johnsbury, Vt.
Geo. E. Howe, M. M. & C. B. St. Johnsbury, Vt.
St. Joseph Valley R. R. 3 g. 15 m. 1 lo. 11 cars.
E. T. Chase, Gen. Man. . Berrien Springs, Mich.
St. Joseph & Des Loge Ry. 3 g. 13 m. 4 lo. 70 cars.
T. T. Onderdonk, Supt. .... Bonne Terre, Mo.
St. Joseph & Western R. R. (See Union Pac.; (1) Div.)
St. Joseph & Des Moines R. R. (See K. C., St. J. & C. B.)
St. Lawrence & Ottawa Ry. (See Can. Pac.)
St. Louis, Alton & Terre Haute R. R.
Main Line. (See C., C., C. & I.; Ind. & St. L. Div.
St. Louis & Cairo Div.: 4-8½ g. 137 m. 17 lo. 800 c.
G. W. Parker, Gen. Man. ...... St. Louis, Mo.
J. L. Hinckley, Supt. ... ... Belleville, Ill.
A. M. De Clerq, M. M. .... St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 31 m. 22 lo. 11 cars.
Wm. Taussig, Gen. Man. .... St. Louis, Mo.
A. W. Dickinson, Supt. ... . St. Louis, Mo.
J. E. Williams, Jr., Pur. Agt. ... St. Louis, Mo.
H. M. Smith, M. M. .... St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 93 m. 10 lo. 217 cars.
Jas. Prentice, Supt. .... Carbondale, Ill.
Jas. C. Bryden, Pur. Agt. ... ... St. Louis, Mo.
St. Louis, Des Moines & Northern Ry. 4-8½ g. 43 m.
C. F. Merk, Supt. .... Des Moines, Ia.
St. L., Ft. Scott & Wichita R. R. 4-8½ g. 160 m. 6 l. 337 c.
J. W. Miller, V. P. & Gen. Man. . Fort Scott, Kan.
Tho. N. Lewis, Asst. Supt. ..... Fort Scott, Kan.
Tho. N. Lewis, Pur. Agt. .... .. Fort Scott, Kan.
Henry Berger, M. M. .... Ft. Scott, Kan.
A. A. Liddell, M. C. B. .... Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 85 m. 5 lo. 70 c.
W. W. Walker, Gen. Supt. .... Hannibal, Mo.
Geo. Douglass, Pur. Agt. .... Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (See Mo. Pac.; (4) Div.)
St. L., Keokuk & No.-W'n. Ry. (See C., B. & Q.)
St. L., Salem & Little Rock. 4-9 g. 72 m. 5 lo. 111 c.
H. A. Crawford, V. Pr. & P. A. .. St. Louis, Mo.
E. B. Sankey, Supt. .... Salem, Mo.
Thomas Everson, M. M. .... Steelville, Mo.
J. W. Houston, M. C. B. .... Steelville, Mo.
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, Gen. Supt. .... St. Louis, Mo.
R. M. Pringle, M. M. .... St. Louis, Mo.
St. L. & San Fran. Ry. 4-8½ g. 902 m. 88 lo. 3,000 c.
C. W. Rogers, V. P. & Gen. Man. St. Louis, Mo.
D. H. Nichols, Mast. Tran. . No. Springfield, Mo.
A. G. Thompson, Pur. Agt. ...... St. Louis, Mo.
M. Kearney, M. M. & C. B. . No. Springfield, Mo.
East Div.: A. Veech, Supt. .... St. Louis, Mo.
Central Div.: W. A. Thoms, Supt. . Springfield, Mo.
Kan. Div.: J. R. Wentworth, Supt. Neodesha, Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, Manager. .... St. Martin's, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4-8½ g. 1,402 m. 201 lo. 5,068 cars.
A. Manvel, Gen. Man. .... St. Paul, Minn.
E. B. Wakeman, Asst. Gen. Supt. St. Paul, Minn.
J. C. Morrison, Pur. Agt. .... St. Paul, Minn.
H. Middleton, M. M. & C. B ... St. Paul, Minn.
Breck. Div.: W. S. Kemp, Supt. .. St. Paul, Minn.
S. F. Div.: J. B. Rice, Supt. .... St. Paul, Minn.
No'n Div.: A. Guthrie, Supt. .... Crookston, Minn.
St. Paul & Duluth R. R. 4-8½ g. 225 m. 37 lo. 1,080 c.
W. H. Fisher, Gen. Supt. .... St. Paul, Minn.
J. G. Callahan, Pur. Agt. .... St. Paul, Minn.
W. McFarland, M. M. .... St. Paul, Minn.
John Hill, M. C. B. .... St. Paul, Minn.
State Line & Sullivan R. R. 4-8½ g. 25 m. 3 lo. 263 c.
I. O. Blight, Supt. .... Towanda, Pa.
Staten Island R. R. 4-8¼ g. 13 m. 4 lo. 18 c.
J. W. Wilbur, Supt. .... New York, N. Y.
Stony Clove & Catskill Mountain R. R.
3 g. 14 m. 2 lo. 22 cars.
Geo. Coykendall, Gen. Supt. ... Rondout, N. Y.
Stony Creek R. R. 4-8½ g. 11 m.
Geo. B. Boggs, Supt. .... Norristown, Pa.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, Supt. .... Sloatsburg, N. Y.
Suffolk Lumber R. R. 3 g. 15 m. 3 lo. 41 cars.
W. M. Whaley, Supt. .. .. Suffolk, Va.
Summit Branch R. R. 4-9 g. 20 m. 7 lo. 10 cars.
Thomas Gucker, Supt. .... Williamsport, Pa.
Susquehanna & Delaware River R. R. In progress.
D. Y. Kilgore, Pres. .... Philadelphia, Pa.
Sussex R. R. (See Del., Lack. & West.)

Syracuse, Binghamton & N. Y. R. R. (*See D. L. & W.*)
Syr., Ontario & N. Y. R. R. (*See N. Y., W. Sh. & Buf.*)
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4–8½ g. 142 m. 28 lo. 1,044 c.
A. H. Gorton, *Supt* ....Corning, N. Y.
W. E. Gorton, *Asst. Supt* ....Corning, N. Y.
Andrew Beers, *Pur. Agt* ....Corning, N. Y.
O. C. Patchell, *M. M* ....Corning, N. Y.
C. J. Butler, *M. C. B* ....Corning, N. Y.

T

Tennessee Coal R. R. 5 g. 28 m. 8 lo. 204 cars.
A. M. Shook, *Gen. Man* ....Tracy City, Tenn.
W. A. Knight, *M. M* ....Tracy City, Tenn.
Tennessee & Sequatchee Valley R. R. 3 g. 42 m. 1 lo. 24 cars.
Chas. Clinton, *Gen. Supt* ....Spring City, Tenn.
P. V. Mooney, *Pur. Agt* ....Spring City, Tenn.
Terre Haute & Indianapolis R. R. 4–9 g. 398 m. 105 lo. 4,170 cars.
Joseph Hill, *Gen. Supt* ....St. Louis, Mo.
C. R. Peddle, *P. Agt* ....Terre Haute, Ind.
Geo. H. Prescott, *S. M. P. & M.* Terre Haute, Ind.
F. C. Cleaver, *M. M* ....Terre Haute, Ind.
E. D. Carter, *M. C. B* ....Terre Haute, Ind.
Chas. Butler, *M. M* ....Effingham, Ill.
Clinton Idler, *Foreman* ....Indianapolis, Ind.
Terre Haute & So.-Eastern Ry. 4–9 g. 44 m. 2 lo. 145 c.
Geo. Atherton, *Supt* ....Terre Haute, Ind.
Texas-Mexican Ry. (*See Mex. Nat.*)
Texas Trunk R. R. 4–8½ g. 36 m. 2 lo. 8 cars.
Hugh Irwin, *Gen. Supt* ....Dallas, Tex.
Texas Western Ry. 3 g. 52 m. 2 lo. 44 cars.
Henry Hatch, *Gen. Man* ....Houston, Tex.
T. F. Glispin, *M. M* ....Houston, Tex.
Texas & N. O. R. R. (*See Cen. Pac.; G. H. & S. A. Div.*)
Texas & Pacific. (*See Mo. Pac. Ry.; (6) Div.*)
Texas & St. Louis Ry. 3 g. 769 m. 84 lo. 2,000 cars.
W. R. Woodard, *Rec* ....St. Louis, Mo.
J. J. Frey, *Gen. Supt* ....St. Louis, Mo.
F. W. Paramore, *Pur. Agt* ....St. Louis, Mo.
G. W. Prescott, *S. M. P. & M* ....St. Louis, Mo.
Tex. Div.: J. T. Gerry, *Supt.* ....Tyler, Tex.
P. J. Milan, *M. M* ....Tyler, Tex.
Tionesta Valley R. R. 3 g. 15 m.
George Dickinson, *Gen. Supt* ....Sheffield, Pa.
Tioga R. R. 4–8½ and 6 g. 67 m. 18 lo. 960 cars.
R. Dupuy, *Supt* ....Blossburg, Pa.
J. C. Guthrie, *Pur. Agt* ....New York, N. Y.
Pere Bonny, *M. M* ....Blossburg, Pa.
D. H. Stratton, *M. C. B* ....Blossburg, Pa.
Toledo, Ann Ar. & No. Mich. Ry. 4–8½ g. 63 m. 9 lo. 186 c.
J. M. Ashley, *Gen. Man* ....Ann Arbor, Mich.
H. W. Ashley, *Supt. & Pur. Agt.* do
C. C. Dodge, *M. M* ....Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 798 m. 101 lo. 3,500 c.
E. P. Murray, *Gen. Supt* ....Toledo, O.
F. W. Stewart, *P. Agt* ....Toledo, O.
L. W. James, *Supt. Mach* ....Delphos, O.
Toledo Div.: W. H. Vandergrift, *Supt.;* do
Thos. Robertson, *M. M* ....Delphos, O.
J. S. Wiers, *For. Car Rep* ....Delphos, O.
Del. & Cin. Divs.: C. A. Bell, *Supt* ....Cin., O.
T. J. Hamer, *M. M* ....Cincinnati, O.
So.-Ea. Div. and Dayton Div.:
C. E. Henderson, *Gen. Man* ....Dayton, O.
W. H. Anderson, *M. M* ....Dayton, O.
St. Louis Div.: Frank F. Allen ....Charleston, Ill.
P. H. Murphy, *M. M* ....Charleston, Ill.
Ironton Div.: C. C. Clark, *Supt* ....Ironton, O.
Toledo & Indianapolis R. R. 4–8½ g. 43 m. 4 lo. 118 c.
M. Clark, *Supt* ....Toledo, O.
H. M. Swan, *M. M* ....Toledo, O.
Toledo & South Haven R. R. (*See Paw Paw.*)
Tonawanda Val. & Cuba R. R. (*See Brad., B. & K.*)
Toronto, Grey & Bruce Ry. 4–8½ g. 191 m. 28 l. 446 c.
Edmund Wragge, *Gen. Man* ....Toronto, Can.
W. Watson, *Pur. Agt* ....Toronto, Can.
David Preston, *M. M* ....Toronto, Can.
Toronto & Nipissing Ry. (*See Mid. Ry. of Can.*)
Troy & Boston R. R. 4–8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, *Pres. & Pur. Agt* ....Troy, N. Y.
Joseph Crandell, *Supt* ....Troy, N. Y.
Z. B. Davis, *M. M* ....Troy, N. Y.
A. Brewer, *M. C. B* ....Troy, N. Y.
Troy & Greenfield R. R. & H. Tunnel. 4–8½ g. 44 m.
A. W. Locke, *Man* ....North Adams, Mass.
Tuckerton R. R. 4–9 g. 31 m. 2 lo. 29 cars.
J. J. Pharo, *Supt. & Pur. Agt.* Tuckerton, N. J.

U

Ulster & Delaware R. R. 4–8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt* ....Rondout, N. Y.
Joseph Rush, *M. M* ....Rondout, N. Y.
John H. Decker, *M. C. B* ....Rondout, N. Y.
Union Pacific Ry. (7 Gen. Divs.) 3 & 4–8½ g. 4,633 m. 510 lo. 10,550 cars.
S. H. H. Clark, *Gen. Man* ....Omaha, Neb.
Thos. L. Kimball, *Asst. Gen Man.* Omaha, Neb.
M. H. Goble, *Pur. Agt* ....Omaha, Neb.
I. H. Congdon, *S. M. P. & C. D* ....Omaha, Neb
John Wilson, *Asst. do* ....Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, *Gen. Supt* ....Omaha, Neb.
E. Div.: C. B. Havens, *Supt* ....Omaha, N. B.
R. McConnell, *M. M* ....Omaha, Neb.
A. M. Collett, *M. C. B* ....Omaha, Neb.
E. Sleppy, *M. M* ....G. Island, Neb.
L. Pole Div.: W. A. Deuel, *Supt* ....Cheyenne, W. T.
J. H. McConnell, *M. M* ....N. Platte, Neb.
R. McDougall, *M. M* ....Cheyenne, W. T.
(2) Wy. Div.: E. Dickenson, *Gen. Supt* ....Laramie, W. T.
T. E. Lewis, *M. M* ....Laramie, W. T.
T. A. Davis, *M. M* ....Rawlins, W. T.
Wes. Div.: C. E. Wurtelle, *Supt.* Evanston, W. T.
Geo. F. Chapman, *M. M* ....Evanston, W. T.
(3) Idaho Div.: W. B. Doddridge, *Gen. Supt.* Ogden, U.
F. Rearden, *M. M* ....Pocatello, Id.
Ogden Short Line Div.:
R. Blickensderfer, *Supt* ....Pocatello, Id.
Utah & Northern Div.:
W. P. P. St. Clair, *Supt* ....Eagle Rock, Id.
W. J. Hemphill, *M. M* ....Eagle Rock, Id.
W. J. Hemphill, *M. M* ....Eagle Rock, Id.
J. W. Paul, *Gen. For. C. D* ....Eagle Rock, Id.
(4) Col. Cent. Div.: A. A. Egbert, *Gen. Supt.* Denver, Col.
F. Meirtsheimer, *M. M* ....Denver, Col.
C. C. Div.: P. Touhy, *Supt* ....Denver, Col.
So. Park Div.: D. K. Sweet, *A. Supt* ....Como, Col.
(5) Kan. Div.: S. T. Smith, *G. Supt.* Kansas City, Mo.
K. Val. Div.: J. O. Brinkerhoff, *Supt.* Kan. C'y, Mo.
Jas. Mackenzie, *M. M* ....Armstrong, Kan.
Kansas Central Div.:
W. T. Kelley, *Supt* ....Leavenworth, Kan.
Smoky Hill Div.:
O. H. Dorance, *Supt* ....Wallace, Kan.
J. B. Dailey, *M. M* ....Ellis, Kan.
(6) Salt Lake & Western Div.:
W. W. Ritter, *Supt* ....Salt Lake City, Utah.
(7) Nevada Central Ry. 3 g. 93 m. 4 lo. 78 cars.
F. W. Dunn, *Gen. Supt. & P. A.* Battle Mt., Nev.
Z. T. Sprigg, *M. M* ....Battle Mountain, Nev.
United States Rolling Stock Co. 19 lo. 4,692 cars.
A. Hegewisch, *Pres* ....New York, N. Y.
W. H. Chaddock, *Gen. Agt* ....Chicago, Ill.
Upson County R. R. (*See Central of Ga.*)
Utah Central Ry. 4–8½ g. 280 m. 21 lo. 358 cars.
John Sharp, *Gen. Supt* ....Salt Lake City, Utah.
S. H. Hill, *Pur. Agt* ....Salt Lake City, Utah.
Geo. G. Bywater, *M. M* ....Salt Lake City, Utah.
Peter Reid, *M. C. B* ....Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m. 3 lo. 33 cars.
W. W. Ritter, *Gen. Man* ....Salt Lake City, Utah.
Robert Anderson, *M. M* ....Salt Lake City, Utah.
Utah & Northern Ry. (*See Union Pac.; (3) Div.*)
Utah & Pleasant Valley Ry. (*See Den. & Rio. Gr.*)
Utica, Ithaca & Elmira Ry. 4–8½ g. 120 m. 11 lo. 152 c.
Geo. S. Sadler, *Supt* ....Elmira, N. Y.
Edw. Mahler, *Pur. Agt* ....Elmira, N. Y.
C. J. Howe, *M. M. & M. C. B* ....Breesport, N. Y.
Utica, & Black Riv. R. R. 4–8½ g. 180 m. 22 lo. 452 c.
J. F. Maynard, *Gen. Supt. & P. A.* Utica, N. Y.
John Bailey, *M. M* ....Utica, N. Y.
David James, *M. C. B* ....Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4–8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, *Gen. Supt* ....Vacaville, Cal.
Valley Ry. (Ohio) 4–8¾ g. 85 m. 15 lo. 581 cars
Isaac Reynolds, *Supt. & P. Agt* ....Cleveland, O.
Chas. Blanchard, *M. C. B* ....Cleveland, O.
Valley R. R. Va. 4 8½ g. 62 m.
S. Spencer, *Pres* ....Baltimore, Md.
Vermont Valley R. R. (*See Conn. River.*)
Vicksburg & Brunswick R. R. (*See Cen. of Ga.*)
Vicksburg & Meridian R. R. (*See Cin., N. O. & Tex. Pac.*)
Vicks. Shreveport & Pac. R. R. (*See C., N. O. & T. P.*)
Victoria Ry. (*See Midland Ry. of Can.*)
Virginia Midland Ry. (*See Rich. & Dan.; (4) Div.*)
Virginia & Truckee R. R. 4–8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 294 m. 6 lo. 134 c.
H. M. Yerington, *Gen. Supt* ....Carson, Nev.
R. J. Laws, *Supt.* (C. & Col.) ....Hawthorne, Nev.
Hume Yerington, *Pur. Agt* ....Carson, Nev.
I. N. Fording, *M. M* ....Carson, Nev.
M. M. Hyde, *M. C. B* ....Carson, Nev.

W

Wabash, Chester & W'n R. R. (*See St. Louis Coal.*)
Wabash, St. Louis & Pacific Ry. (4 Gen. Divs.) 4–8½ g. 3,241 m. 598 lo. 17,230 cars.
A. L. Hopkins, *2d V. P* ....St. Louis, Mo.
A. A. Talmage, *Gen. Man* ....St. Louis, Mo.
R. B. Lyle, *Pur. Agt* ....St. Louis, Mo.
Jacob Johann, *Gen. M. M* ....Springfield, Ill.
U. H. Kohler, *Gen. M. C. B* ....Toledo, O.
(1) Eas'n Div.: G. W. Stevens, *Supt* ....Peru, Ind.
J. B. Barnes, *M. M* ....Fort Wayne, Ind.
John McKenna, *M. M* ....Peru, Ind.
Cairo Div.: *M. M* ....Carmi, Ill.
Rant'l Div.: B. F. Mathias, *Asst. Supt.* Rantoul, Ill
J. McCarthy, *M. M* ....Rantoul, Ill
(2) Middle Div.: H. F. Clark, *Supt* ....Springfield, Ill.
B. B. Rose, *M. C. B* ....Decatur, Ill.
G. A. Hurd, *Asst. Supt.* ....Forest, Ill.
(3) Northern Div.: E. N. Armstrong, *Supt.* Peoria, Ill.
R. M. Hemphill, *M. C. B* ....Peoria, Ill.
E. B. Hyde, *Asst. Supt* ....Havana, Ill.
(4) Western Div.: R. S. Miner, *Supt* ....Moberly, Mo
W. H. Selby, *M. M* ....Moberly, Mo.
C. S. Buck, *M. C. B* ....Moberly, Mo.
E. Dresser, *Asst. Supt* ....Stanberry, Mo
D. Moin. Div.: C. F. Meek, *A. Supt.* Des Moines, Ia
Walden's Bridge R. R. 3 g. 23 m. 3 lo. 37 cars.
John G. Scott, *Gen Man* ....Jenks P. O., Tenn.
Wallkill Valley.
J. E. Childs, *Gen. Supt* ....New York, N. Y.
Geo. H. Graves, *Supt* ....Kingston, N. Y.
E. Minshull, *M. M* ....Middletown, N. Y.
I. W. Fowler, *Pur. Agt* ....Middletown, N. Y.
Walla Walla & Columbia Riv. R. R. (*See Ore. Ry.*)
Walton R. R. 5 g. 10 m. 1 lo. 7 cars.
D. H. Walker, *Pres* ....Monroe, Ga.
Warren & Farnsworth Valley R. R. 3 g. 11 m. 3 lo. 39 cars.
A. D. Wood, *Supt* ....Warren, Pa.
Warwick Valley R. R. (*See Leh. & Hud. River.*)
Wasatch & Jordan Valley R. R. (*See Den. & Rio. Gr.*)
Washington, Ohio & West. R. R. 4–8½ g. 52 m. 5 lo. 87 c.
S. M. Brophy, *Supt* ....Alexandria, Va.
W. Mountjoy, *Act. For.* ....Alexandria, Va.
John Harrison, *M. C. B* ....Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 29 m. 3 lo. 26 c.
C. E. Bower, *Supt* ....Waynesburg, Pa.
A. M. Kline, *M. C. B* ....Waynesburg, Pa.
Welland Ry. 4–8½ g. 25 m. 4 lo. 147 cars.
William Pay, *Supt* ....St. Catharines, Ont.
Jas. Taylor, *M. M* ....St. Catharines, Ont.
Wm. H. Pay, *M. C. B* ....St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m. 3 lo. 13 c.
Rolla Wells, *Supt* ....St. Louis, Mo.
M. M. Hodgman, *M. M* ....Florissant, Mo
West Feliciana R. R. 4–8½ g. 27 m. 2 lo. 22 cars
J. B. McGehee, *Pr. & Gen. Supt.* Bayou Sara, La.
J. A. Tilton, *M. M. & C. B* ....Bayou Sara, La
W. Va., Central & Pittsb'g Ry. 4–8½ g. 50 m. 4 lo. 119 c.
T. B. Davis, *Gen. Man* ....Piedmont, W. Va.
W. E. Porter, *Gen. Supt* ....Piedmont, W. Va
Geo. W. Harrison, *Pur. Agt* ....Piedmont, W. Va.
E. W. Lippencott, *M. M* ....Piedmont, W. Va.
West & East R. R. (*See Ill. Cen.; N. O. Div.*)
West Jersey R. R. (*See Penn. R. R.; (3) Div.*)
Western R. R. (of Ala.) 5 g. 85 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 240 c.
Cecil Gabbett, *Gen. Man. & Supt* ....Mont., Ala.
C. D. Wall, *M. M. & C. B* ....Montgomery, Ala.
Western Counties' Ry. 4–8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, *Supt* ....Yarmouth, N. S.
Western Maryland R. R. 4–8½ g. 157 m. 25 lo. 439 c.
J. M. Hood, *Pr. & Gen. Man* ....Baltimore, Md.
R. J. Adair, *Pur. Agt* ....Baltimore, Md.
David Holtz, *Mast. of Mach.* Union Bridge, Md.
J. H. Nussear, *M. C. B* ....Union Bridge, Md.
Western No. Carolina R. R. 5 g. 210 m. 17 lo. 160 c.
V. E. McBee, *Supt* ....Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt* ....Richmond, Va.
G. W. Gates, *M. M* ....Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 58 lo. 952 c.
R. A. Anderson, *Gen. Supt* ....Atlanta, Ga.
A. B. Bostwick, *Asst. Supt* ....Atlanta, Ga.
John H. Flynn, *M. M. & C. B* ....Atlanta, Ga
Wheeling, Pittsburg & Baltimore R. R. (*See B. & O.*)
Wheeling & Lake Erie R. R. 267 m. 31 lo. 1,456 c.
M. D. Woodford, *Gen. Man* ....Toledo, O
O. P. Dunbar, *Gen. M. M* ....Norwalk, O.
John Hillhouse, *Div. M. M* ....Norwalk, O.
Cleve. & Mar. Div.:
A. Galloway, *Div. M. M* ....Cambridge, O
Whitby, Port Perry & Lindsay Ry. (*See Mid. of Can.*)
White Water R. R. (*See Ft. W., Cin. & Lou.*)
Whitefield & Jefferson R. R. (*See Bos., Con. & Mon.*)
Whitneyville & Machiasport R. R. 8 m. 2 lo. 48 c.
C. Sullivan, *G. M. & Pur. Agt.* Whitneyville, Me.
Wicomico & Pocomoke R. R. 4–8½ g. 30 m. 2 lo. 38 c.
L. Showell, *Pres* ....Berlin, Md.
Williamsport & North Branch R. R. 4–8½ g. 9 m. 2 lo. 4 cars.
B. G. Welch, *Man. & P. Agt* ....Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M.* do.
Williamstown & Del. River R. R. 4–8½ g. 9 m. 1 lo. 10 cars.
Samuel Garwood, *Supt* ....Williamstown, N. J.
Wilmington, Columbia & Augusta R. R. (*See W. & W.*)
Wilmington & No'n R. R. 4–8¾ g. 85 m. 16 lo. 148 c.
J. H. Thompson, *Supt. & P. A.* Coatesville, Pa.
George Rommel, *M. M* ....Coatesville, Pa
Alex. Maitland, *M. C. B* ....Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs. 5 g. 599 miles 70 locomotives 1,120 cars.
R. R. Bridgers, *Gen. Man* ....Wilmington, N. C.
J. F. Divine, *Gen. Supt* ....Wilmington, N. C.
John Bisset, *M. M* ....Wilmington, N. C.
W. H. Day, *M. C. B* ....Florence, S. C.
J. H. Davis, *M. C. B.* (W. & W.) Wilmington, N. C.
Winifrede R. R. 4–9 g. 5 m. 1 lo. 65 cars.
Theodore Wright, *Pres* ....Philadelphia, Pa.
Windsor & Annapolis Ry. 4–8½ g. 130 m. 10 lo. 160 c.
P. Innes, *Gen. Man* ....Kentville, N. S.
Wm. Yould, *M. M* ....Kentville, N. S.
Wm. Grierson, *M. C. B* ....Kentville, N. S.
Wisconsin Central R. R. 4–8½ g. 480 m. 49 lo. 1,800 c.
F. N. Finney, *Gen. Man* ....Milwaukee, Wis.
E. K. Howes, *Pur. Agt* ....Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M* ....Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, *S.* Milwaukee, Wis.
Wis., Minn. & S. M. & N. Div.:
W. E. Carroll, *Supt* ....Stevens Point, Wis.
Wisconsin, Iowa & Nebraska.
G. C. McMichael, *Supt* ....Marshalltown, Ia.
Wisconsin & Michigan R. R. (*See Mil. & North'n.*)
Wisconsin & Minnesota R. R. (*See Wis. Cen.*)
Wood River Branch R. R. 4–8½ g. 6 m. 2 lo. 3 cars.
L. M. Barber, *Supt* ....Hope Valley, R. I.
Woodstock R. R. 4–8½ g. 14 m. 1 lo. 3 cars.
J. G. Porter, *Supt* ....Woodstock, Vt.
Worcester, Nashua & Rochester R. R. 4–8½ g. 95 m. 20 lo. 523 cars.
C. S. Turner, *Pres. & G. Man.* Worcester, Mass.
G. W. Hurlburt, *Supt* ....Worcester, Mass.
John G. Brady, *M. M. & C. B.* Worcester, Mass.